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October 2, 2012

Mr. Erich Weissbart
United States Environmental Protection Agency-Region III
General Operations Branch
1650 Arch Street
Philadelphia, PA 19103-2029

Phase IV RFI Work Plan
DuPont Belle Plant
Belle, West Virginia

Dear Mr. Weissbart:

DuPont is pleased to submit this Phase IV RCRA Facility Investigation (RFI) Work Plan for the Plant Area of the DuPont Belle Plant, located in Belle, West Virginia. This work plan provides background information, study objectives, the technical approach, procedures for performing the work, and schedule for completion.

Two hard-copies and one electronic file are included here for your review and approval. DuPont would like to begin the geophysical mapping discussed in Section 2.2 of the Phase IV RFI Work Plan on October 22, 2012.

If during your review of this document, you have comments or questions that you would like to discuss, please feel free to contact me. I can be reached at 302.999.2533.

Sincerely,

Michael Sherrier
Project Director
Corporate Remediation Group

cc: Catherine Guynn, WVDEP
DuPont File (507878)
URS File (18985707.11010)

Phase IV RFI Work Plan
DuPont Belle Plant
Belle, West Virginia

Date: October 2012 Project No.: 18986236.12001

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1.0 Introduction

In September 1998, the U.S. Environmental Protection Agency (EPA) issued E.I. du Pont de Nemours and Company (DuPont) the Corrective Action portion [Hazardous and Solid Waste Amendments (HSWA) permit] of the Resource Conservation and Recovery Act (RCRA) Permit (Permit No. WVD 00-501-2851), requiring that corrective action be initiated at its Belle Plant located in Belle, West Virginia. During the years since the RCRA Permit was issued, Phases I through III of the RCRA Facility Investigation (RFI) have been completed. The completed studies focused primarily on the Belle Mountain Area of the site, with limited investigation of the Plant Area. The Phase IV RFI focuses on the Plant Area.

Each of the 184 solid waste management units (SWMUs) and areas of concern (AOCs) located within the Plant Area was evaluated using the Belle Plant Area Decision Tree to determine the proposed investigation status. The Belle Plant Area Decision Tree is a process of evaluation that was developed such that each SWMU and AOC on the plant site would be consistently evaluated by anyone using the process and was electronically approved by EPA on June 19, 2012. During this evaluation, SWMUs and AOCs were categorized as:

- No Further Action
- No Further Investigation Required (RFI complete)
- Investigation to be Deferred (until such time as it can be safely investigated)
- Investigation Needed (To Be Proposed in Phase IV RFI)

The Belle Plant Area Decision Tree process and results are provided in Appendix A. Thirty-five SWMUs and four AOCs located within the Plant Area were identified which will be investigated during the Phase IV RFI. Figure 1 presents the location to be investigated. This work plan describes the Phase IV investigations proposed for each of the locations indicated in Figure 1.

1.1 Objectives and Technical Approach

The objectives of the Belle Plant Area Phase IV RFI are as follows:

- Sample soil, sediment, and groundwater, as appropriate, in the vicinity of the 35 SWMUs and four AOCs identified to determine if releases have occurred.
- Determine the nature and extent of any identified releases associated with past waste management practices at SWMUs and AOCs.
- Evaluate potential risk to human health and the environment from releases identified at corrective action units during this investigation.
- Collect additional information to update the site conceptual model.

To meet these objectives, two phases of field investigation are proposed. The first phase will include a Release Assessment. The second phase, the Delineation Investigation, will focus on delineation of any identified releases.

The first phase will use a flexible technical approach which includes the following process and methods that are summarized here and discussed in detail in Section 2.0:

- Propose initial boring locations for the SWMUs, AOCs and buildings to be investigated.
- Map underground utilities and obstructions to clear the proposed areas near boring locations via geophysical methods and, if needed, adjust the proposed boring locations.
- Advance direct push borings using a Geoprobe® or similar direct push rig and conduct real-time data acquisition and analysis during boring advancement using a high resolution vertical profiling system that consists of:
    - a Membrane Interface Probe (MIP) system which will be used to screen borings for volatile organic compounds (VOC) and a subset of detectable semi-volatile organic compounds (SVOC) in potential release areas.
    - a Laser Induced Fluorescence (LIF) system which will be used, if needed, to delineate the depth and horizontal extent of free product and residual petroleum contamination.
    - a Hydraulic Profiling Tool (HPT) system which will be used to provide an indication of soil characteristics, to locate and define migration pathways for contamination and to identify the aquifers and confining units.
- Collect surface soil, subsurface soil and/or groundwater samples for VOC, SVOC and metals analysis, sampling both potentially impacted and clean zones as indicated based on real-time data analysis and on field conditions encountered.

During the initial investigation, the results real-time investigation at a particular SWMU or AOC may indicate that advancing additional borings (beyond those identified in this work plan) is recommended to complete the Release Assessment. In that case, additional borings may be advanced and samples collected, if plant conditions allow and the borings can be advanced safely.

Samples collected will be submitted to an off-site laboratory for analysis with results available within approximately four weeks of submission. Data evaluation will begin as soon as the data become available and will continue through receipt of the final results for the last sample submitted.

Should additional work be required to delineate any releases identified during the initial phase of the field investigation, the second phase of the field investigation, the Delineation Investigation, will be completed using the same approach as the initial investigation. However, the second phase will focus only on those areas where a release was identified.

Five locations have been identified from which sediment samples will be collected and sample collection will not use the above described technical approach. Sediment

collection methods in these locations will be dependent upon specific conditions encountered at those locations, but will follow standard sampling protocols.

At locations where plant activities and/or physical constraints impede access to the investigation location, the above described investigation method may not be applied; investigation methods appropriate to the specific conditions, such as a portable sampling device will be employed, and standard sampling protocols will be followed.

1.2 Organization of the Phase IV Work Plan

This work plan is organized in the following sections:

- Section 2.0, Release Assessment Investigation Activities
- Section 3.0, Data Quality and Data Evaluation
- Section 4.0, Schedule and Reporting
- Section 5.0, References

2.0 Release Assessment Investigation Activities

As described above in Section 1.1, a flexible technical approach will be employed for this proposed investigation of select areas of the Belle Plant Area to determine if releases have occurred and to determine the nature and extent of any releases identified. The sections below provide more details on the approach and methods to be used during the initial release assessment field investigation and during the subsequent delineation field investigation, if needed.

2.1 Proposed Boring Locations

Figure 1 provides the locations of the 35 SWMUs and four AOCs to be investigated. Table 1 provides summary information for the investigation areas included in this work plan. Table 1 includes the following information:

- SWMU/AOC Number
- SWMU/AOC Name
- SWMU/AOC Description [from the Current Conditions Report (DuPont, 1999)]
- Investigation Rational Based on the Decision Tree Evaluation
- Proposed Investigation and Figure References

Table 1 also references Figures 2 through 17 in the last column titled "Proposed Investigation." These figures show the boring and sample locations for each investigation area. These figures are organized based on SWMU and AOC locations within Figure 1, starting from the northwest end of the site, moving towards the southeast end.

2.2 Underground Utility Mapping, Clearing and Excavation Permits

Prior to conducting intrusive subsurface sampling, geophysical methods will be used to identify underground utilities and obstructions in each investigation area to confirm that the proposed boring locations are clear. Proposed boring locations will be moved, if needed, to ensure that underground utilities and objects will not be encountered during advancement of the borings. If additional boring advancement is required outside of the area initially cleared, additional mapping and clearing will be completed prior to boring advancement. In addition, all required site excavation permits will be obtained prior to intrusive subsurface sampling.

2.3 Boring Advancement

Direct push borings will be advanced using a Geoprobe® or similar direct push rig. If the investigation area will not allow for equipment of this size or type, alternative boring advancement equipment will be used as appropriate. The coordinates of each boring will be documented using a global positioning system (GPS). Boring advancement will be conducted as described in the procedures and methods in the *Quality Assurance Project*

Plan (QAPP), originally included as Appendix C of the *Phase I RFI Work Plan* (DuPont CRG, 2000).

2.4 Real-Time Data Evaluation

The high resolution vertical profiling system used in this investigation consists of three tools and real-time data acquisition and analysis of the results from those three tools. The first tool, the MIP system, will be used for mapping VOC and a subset of SVOC contamination in soil and groundwater. A standard configured MIP will detect most compounds in the standard VOC range and with an enhanced heating and transfer system a number of compounds in the SVOC range. Compounds with a volatility or vapor pressure of less than 100 Pascals or boiling points above 200-250 degrees Centigrade will likely not be detected by the MIP because of insufficient vapor transfer from the downhole probe to the gas chromatographic detectors at the surface. The MIP contains a sensor detection system consisting of a photoionization detector (PID), a flame ionization detector (FID), and an electron capture detector (ECD).

The HPT with an integrated soil electrical conductivity (EC) probe, the second tool, will be used to provide indication of general soil characteristics such as permeability and the potential for contaminant transport via groundwater flow. The MIP system and HPT are contained in a single probe which will be advanced into the subsurface via the Geoprobe®.

The third tool, The LIF system, will be advanced by the Geoprobe®, if needed, to delineate the depth and horizontal extent of free product and residual petroleum contamination including polycyclic aromatic hydrocarbons (PAHs).

The high resolution vertical profiling system used in this investigation will be provided by Columbia Technologies (in Baltimore, Maryland). Operating Procedures (SOPs) for these three tools are provided in Appendix B. Real-time data acquisition and analysis of the results from the three tools will be used to guide sample collection as described below.

2.5 Sample Collection and Analysis

As stated above, collection of samples (media to be sampled from each boring and the number of samples collected) will be guided by the real-time data evaluation including the identification of potential VOC and/or SVOC impacts and by the identification of zones of higher permeability, which may allow movement of constituents of concern in the subsurface. Collection of samples will also be guided by other field conditions observed, such as visual observations and odors.

At SWMUs or AOCs where evidence of a potential release is indicated by the real-time data, a minimum of two soil samples will be collected, one soil from the surface and one soil from the subsurface. The most appropriate subsurface sample depths will be determined in the field on the basis of the real-time data evaluation. Groundwater samples may also be collected, if the real-time data analysis indicates the presence of impacts within permeable, saturated zones. Additional soil and / or groundwater samples

may be collected during the release assessment, if deemed appropriate on the basis of the real-time data analysis.

Soil and groundwater samples (if collected) will be analyzed for Appendix IX VOCs, SVOC, and/or metals to identify release constituents. Analytical results from these boring will also be used to confirm the real-time data.

At SWMUs or AOCs where no evidence of potential release is indicated by the real-time data, at least one surface soil sample and one subsurface soil sample will be collected and analyzed for Appendix IX VOCs, SVOC, and metals. These samples will be collected to verify the real-time findings and confirm that a release has not taken place. The sub-surface samples will be collected immediately above the first water encountered. Additional soil and/or groundwater samples may be collected to confirm that a release has not occurred.

Samples from a select group of investigation areas will be analyzed for a reduced analyte list based on the unit description or history, as indicated in Table 1.

2.5.1 Soil Sampling

Soil will be sampled as described in the procedures and methods included in the QAPP (DuPont CRG, 2000). The direct push rig with a macro core sampler will be used to obtain soil samples. For surface and subsurface soil, one sample aliquot will be collected immediately for VOC analysis in accordance with EPA SW846 methods. Clean spatulas, spoons or other tools will be used to transfer soil for SVOCs, metals and other parameters to a decontaminated stainless-steel bowl or re-sealable plastic baggie, where it will be thoroughly mixed and transferred to laboratory-supplied containers.

2.5.2 Groundwater Sampling

Groundwater will be sampled as described in the procedures and methods included in the QAPP (DuPont CRG, 2000). When appropriate, in-situ groundwater samples will be collected for sampling purposes using a Hydropunch sampling device. A drop screen will be advanced to the target depth (based on soil boring) and deployed. Dedicated polyethylene tubing will be lowered through the direct push rods and into the drop screen interval. Using a peristaltic pump, groundwater will be extracted from the sampling point for sample collection purposes. All groundwater samples collected via hydropunch will be filtered during collection using a 0.45 micron, high-flow filter to remove suspended sediments.

Additionally, monitoring wells may be installed at areas determined to have potential releases and impacts to groundwater are indicated. All new wells will be installed in accordance with procedures and methods described in the *Phase I RFI Work Plan* (DuPont CRG, 2000), and in the QAPP (DuPont CRG, 2000). All new wells will be sampled in accordance with procedures and methods described in the QAPP (DuPont CRG, 2000). All samples from monitoring wells will be collected using standard low-flow sampling techniques. Samples collected from monitoring wells for VOC and SVOC analysis will be unfiltered. Both filtered and un-filtered samples will be collected from

monitoring wells for metals analysis. All new wells will be sampled in accordance with procedures and methods described in the QAPP (DuPont CRG, 2000).

2.5.3 Sediment Sampling

Sediment will be sampled as described in the procedures and methods included in the QAPP (DuPont CRG, 2000). Sediment samples will be collected using a decontaminated dredge, scoop, or spoon depending on surface-water depth. The 0 to 6-inch interval of sediment will be collected and portioned for analysis in the same manner as soil samples stated above.

2.6 Expanded Investigation

Based on the results of the real-time data evaluation and the field conditions observed, specific investigation areas may be expanded beyond the initially proposed areas, to evaluate the extent of any potential release areas identified. If investigation areas are expanded, all new locations proposed for boring advancement will be cleared as described above in Section 2.2 prior to boring advancement.

2.7 Data Evaluation and Release Identification

The data evaluation process will include a comparison of constituent concentrations to the EPA Regional Screening Levels (SLs) (latest edition). The quantitative comparison (i.e., data screening) and a comparison to site-specific industrial background levels will be used to determine if a release from the SWMU or AOC had occurred. Background fill samples will be collected as part of the Release Assessment, using the Geoprobe® and the sampling methods described above in Section 2.5.1 at the locations illustrated in Figure 18. To determine site background concentrations, 10 soil borings will be advanced to a depth equivalent to the elevations reached during RFI sampling activities. Samples will be collected from locations and depth intervals where fill material is present. All background samples will be analyzed for Appendix IX metals and PAHs. Additional details on the data evaluation are provided in Section 3.2.

2.8 Subsequent Delineation Investigation

As stated above in Section 1.1, additional work required to delineate any impacts identified during the Initial Release Assessment will be conducted during the Delineation Investigation. The Delineation Investigation, if needed, is anticipated to be conducted using the same approach as the Release Assessment, but will be focused only on those areas where releases were identified, and on the specific constituents identified within the releases.

Following identification of any releases, delineation sampling locations will be shared with EPA. The Delineation Investigation will use the same approach described above in Sections 2.2 through 2.5. However, a certified mobile laboratory may be brought to the site and used for analysis of the samples, provided the identified constituents can be analyzed by the mobile laboratory and that the results generated meet the data quality objectives for the investigation.

3.0 Data Quality and Data Evaluation

This section describes the RFI quality assurance/quality control (QA/QC) program and screening levels that will be used to evaluate RFI analytical data.

3.1 Data Quality

The purpose of the RFI QA/QC program is to ensure that collected data are both representative and valid. Data quality objectives (DQOs) enable the decision maker to assess the level of certainty that can be attributed to environmental measurements. The QAPP (DuPont CRG, 2000), originally included as Appendix C of the *Phase I RFI Work Plan* (DuPont CRG, 2000), addresses each of the following DQOs: accuracy, precision, completeness, representativeness, and comparability.

To ensure that the DQO for comparability will be satisfied, all sampling activities will follow the standard operating procedures described in the QAPP and previously presented in the *Phase I RFI Work Plan* (DuPont CRG, 2000). Each sample will be documented at the time of collection by the investigator. The sample quantity, type (i.e., composite or grab), and sample location will be recorded in the field logbook. Sample containers will be labeled with sample identification numbers. Chain-of-custody forms will be completed, and the sample shipping cooler will be secured with a custody seal. The time and date of collection, proposed laboratory analyses, and sampler's initials will be included on the chain-of-custody.

During the Phase IV RFI, the following QA/QC samples will be collected and analyzed to document sample integrity and field procedures:

- Trip blanks (where applicable)
- Equipment rinsate blanks
- Field duplicates
- Matrix spike/matrix spike duplicates (MS/MSDs)

Laboratory method blanks will also be prepared and analyzed along with the samples to monitor potential contamination as a result of the analytical process. In addition, laboratory control samples will be prepared and analyzed along with the samples to monitor on-site and off-site laboratory performance.

Analytical data included in this report will be reviewed in accordance with the DuPont In-House Data Review (DDR) process to determine data usability. The DDR process consists of an evaluation of the data based on hold times, blank contamination, MS/MSD recoveries, MS/MSD relative percent differences, laboratory control spike/laboratory control spike duplicate (LCS/LCSD) recoveries, LCS/LCSD relative percent differences, and surrogate recoveries.

Because the DuPont DDR review process noted above will be performed on 100% of the data generated for the Phase IV RFI, 10% of the groundwater and soil data sets will be

submitted for third-party data validation. The URS Project Chemist will work with the URS Project Manager to select the samples to be submitted for validation.

3.2 Data Evaluation

Data collected during the Phase IV RFI will be evaluated to assess whether the investigation objectives were met. The data evaluation process will include a comparison of constituent concentrations to the SLs (latest edition). The quantitative comparison (i.e., data screening) will be used to determine if a release from the SWMU or AOC had occurred and whether this release presents a potential concern for human health or the environment. Consistent with EPA Region 3 policy, the following SLs will be used.

- Groundwater: Constituents detected in groundwater will be compared to the lower of the Federal Maximum Contaminant Level (MCL) or the SLs for tap water. The SLs are based on a cancer risk of 1×10^{-6} and a hazard quotient of 0.1 for noncarcinogens.
- Soil and Sediment: Soil and Sediment: Soil and sediment concentrations will be compared to industrial SLs. Similar to groundwater, the SLs will be based on a cancer risk of 1×10^{-6} and a HQ of 0.1 (for non-carcinogens). This is considered a very conservative screening for sediment because exposure to sediment would be less frequent than the assumptions used in the development of the SLs. Consistent with Region 3 policy, soil and sediment concentrations will also be conservatively compared to residential SLs for risk management purposes. Soil concentrations will also be compared to site-specific industrial background concentrations to be determined during the Phase IV RFI (see Section 2.8 and below).

  Constituent concentrations in soil and groundwater will be used to determine whether a unit is a potential source to groundwater. Where groundwater data are not available, soil concentrations will also be compared to EPA SLs for protection of migration to groundwater [soil screening levels (SSLs)] with a dilution attenuation factor (DAF) of 20.

  Sediment concentrations, from depths or areas which represent ecological exposure media, will be compared to EPA Region 3 Biological Technical Assistance Group (BTAG) screening values or other appropriate benchmarks.

Dioxin and furan results in soil will be converted to toxicity equivalencies (TEQs) using the 2005 World Health Organization (WHO) toxicity equivalency factors (TEF). The total TEQ will be compared to the EPA Region 3 recommended preliminary remediation goal (PRG) of 0.00066 mg/kg. The PRG of 0.00066 mg/kg (or 660 nanograms per kilogram [ng/kg]) is based on the reference dose (RfD) of 7E-10 mg/kg provided in EPA's Integrated Risk Information System (IRIS) in February 2012. The PRGs are generally recommended as a starting point for actions taken at RCRA corrective action sites.

During historic expansion activities at the Belle Plant, industrial fill material was used to grade areas prior to building construction. Fill material potentially consisted of coal-fired

boiler ash, coke fines, coke plant sludge, incinerator residue, organic wastes and lime. As a result, background fill samples will be collected as part of the Phase IV RFI to determine if constituents detected at SWMUs or AOCs, where fill material has been placed, are associated with releases at the units or are consistent with the presence of fill materials.

Site-specific background concentrations will be determined using statistical procedures available in EPA's ProUCL software (most recent release). ProUCL provides several parametric and non-parametric methods to calculate background threshold values and to determine if a statistical difference is noted in the comparison of background versus the RFI data set for each unit. If a statistical difference is not observed in the comparison, then it will be concluded that constituents detected at the unit reflect industrial fill conditions and are not related to a particular release from the unit.

Prior to the calculation of background threshold values, tests for outliers will be performed (such as Dixon's test) using ProUCL. Data suspected of being outliers will be further evaluated to determine their inclusion in the calculations of background threshold values.

4.0 Schedule and Reporting

The following time line is proposed for the completion of the Phase IV RFI.

Task	Date
EPA review and approval of the Phase IV RFI Work Plan	October 2012
Plant Area geophysics mapping and Excavation Permits	October 2012
Mobilization of MIPs	October 2012
Contractor Orientation	October 2012
Initial RFI fieldwork phase	October-November 2012
Second phase of field investigation, if needed	1Q, 2013
Interpretation of data	1Q, 2013
Data analysis and interpretation	1Q, 2013 - 2Q, 2013
Report generation and review	2Q 2013
Report submission	Late 2Q, 2013

5.0 References

DuPont CRG. 2000. *Phase I RCRA Facility Investigation Work Plan*. DuPont Belle Plant, Belle, West Virginia, February 2000.

DuPont CRG, 2000. Quality Assurance Project Plan. DuPont Belle Plant, Belle, West Virginia, February 2000.

DuPont CRG. 1999. *Current Conditions Report*. DuPont Belle Plant, Belle, West Virginia, February 26, 1999.

Tables

Table 1
Phase IV RFI Work Plan
DuPont Belle Plant, Belle West Virginia

SWMU/ AOC Number	SWMU/AOC Name	SWMU/AOC Description [from Current Conditions Report (1999)]	2012 SWMU/AOC Description	Investigation Rational Based on Decision Tree Evaluation	Proposed Investigation
54	Ag-Mature SBU Brine Treatment System-Former Raw Waste Storage Tank	The Ag-Mature Brine Treatment System consists of SWMUs 54-62. The system is used to treat waste brine generated during the manufacture of an agricultural fungicide.	Tank was removed. Only the pad remains.	• Secondary containment may not be reliable – gravel pad and a gravel soil berm, some concrete wall • No relevant data	3 borings VOCs SVOCs Metals Ammonia See Figure 2
191	Inactive Disposal Area 8	This unit is a 1.5-acre area where coal fired boiler ash and coke fines were used as above-grade fill material. The depth of the material is not known. The area is now covered with gravel or asphalt and used as a parking area, rail yard, and SSS Area waste storage tank area.	Area is now paved parking lots used for trailer parking.	• No closure documentation • Below ground	5 borings VOCs SVOCs Metals Dioxins/Furan See Figure 3
AOC E	AOC E Underground Fuel Storage Tanks	The original tanks were installed in 1979 and replaced in 1989 with two underground, 8,000-gallon, double-walled, fiberglass fuel storage tanks. One of the tanks contained diesel fuel and the other gasoline. Closed Under UST Program	New tanks were installed and are in use.	• Investigation proposed based on CCR (1999)	4 borings VOCs SVOCs Metals TPH DRO TPH GRO MTBE TBA See Figure 3
AOC A	AOC A Former Coke Plant and Benzol Process Area	All buildings and support equipment associated with the Coke plant and Benzol Process Area have been removed.	Dismantled and paved.	• Secondary containment may not be reliable near Former Coke Plant – asphalt pavement with no curbs and high-level alarm • No relevant data	6 borings VOCs SVOCs Metals See Figure 3
153	WCS No. 14 Pumping Station	These units (SWMUs 145 to 161) consist of the Facility sewer lines, a series of pumping stations, collection flumes, and ancillary pumps. The purpose of these units is to collect both sanitary and process waste waters and convey the wastes to the WWTP. The system is all gravity flow. Small infrequent overflows have occurred from the pumping stations due to equipment failure. Lines are replaced on an as-needed basis as lines fail. Releases have occurred from these units.	In use.	• Known releases • No relevant data	3 borings VOCs SVOCs Metals See Figure 4
155	WCS No. 15 Pumping Station	See SWMU 153	In use.	• Known releases • No relevant data	3 borings VOCs SVOCs Metals See Figure 4

Table 1
Phase IV RFI Work Plan
DuPont Belle Plant, Belle West Virginia

SWMU/ AOC Number	SWMU/AOC Name	SWMU/AOC Description [from Current Conditions Report (1999)]	2012 SWMU/AOC Description	Investigation Rational Based on Decision Tree Evaluation	Proposed Investigation
32 33 34 35	Former OSD Hazardous Waste Storage Tank (ID No. 3A, 3B, 3C, 3D)	These units consisted of four tanks (SWMUs 32-35) that were used to store wastes generated onsite prior to burning at the Operations Service Department (OSD) Coal/Waste-Fired Boilers. The units were above ground tanks (varying in size) and constructed on gravel pads. After removal of the fourth tank, some staining was noticed. Gravel and soil were removed. These units were closed in 1981 without an approved closure plan. The facility was fined for closing these units without an approved closure plan. However, no additional remedial activities were required for the unit by either the EPA Region III or WVDNR.	Tanks gone. Asphalt parking with some new infrastructure	• Release known at fourth tank, 800 cubic yards of impacted soil/gravel removed • No relevant data - no confirmatory sampling	6 borings VOCs SVOCs Metals See Figure 5
72	Former MDA Deep Well Storage Tank	This unit is a 110,000-gallon, stainless steel tank which is 25 ft. in diameter and 30 ft. tall. The tank is located above ground on a concrete pad, surrounded by gravel, with no secondary containment. This unit was used to store adipic acid waste and later to accumulate waste brine from the MDA process. The unit is no longer in service, but is still in place.	Tank was removed. Concrete pad now has a shed on it.	• No secondary containment • No relevant data	3 borings VOCs SVOCs Metals See Figure 5
151	WCS No. 12 Pumping Station	See SWMU 153	In use.	• Known releases • No relevant data	3 borings VOCs SVOCs Metals See Figure 6
150	WCS No. 11 Pumping Station	See SWMU 153	Investigation of sediments within the sump is required as potential release has occurred	• Investigation Deferred for the SWMU itself • Mercury has been identified in drains and traps of the Control Lab which may have occurred during operations and waste practice at the Control Lab • Sediments within SWMU 150 may have been impacted by the release.	Sediment Sampling in No. 11 pump station Mercury See Figure 7
121	HCO Oil Storage Tank	This unit was a 5,390-gallon, flat bottom, carbon steel tank located on a concrete pad. The tank was 7.5 ft. in diameter, and 15.5-ft. tall with a closed top. The unit managed waste oil from the Hydrogen-Carbon Dioxide (HCO) process area Oil/Water Separator.	Area is a small gravel lot with a pipe rack and small metal building on it.	• Secondary containment may not be reliable – asphalt pavement with no curbs and high-level alarm • No relevant data	2 borings VOCs SVOCs Metals See Figure 7

Table 1
Phase IV RFI Work Plan
DuPont Belle Plant, Belle West Virginia

SWMU/ AOC Number	SWMU/AOC Name	SWMU/AOC Description [from Current Conditions Report (1999)]	2012 SWMU/AOC Description	Investigation Rational Based on Decision Tree Evaluation	Proposed Investigation
122	HCO Waste Lubricating Oil Collection Sumps	This unit consisted of collection sumps which received waste oil and water from the compressors. The sump tanks were constructed of steel and have a 400-gallon capacity.	Building dismantled and SWMU no longer exists and area is covered by gravel.	• Below ground • Safe investigation is possible at this time	10 borings (use sump schematic drawing to estimate the compressor locations) VOCs SVOCs Metals See Figure 7
48	Ag-Mature SBU Waste Loading Area	The unit is a 30 ft. long, 10 ft. wide asphalt pad. The unit is used for loading waste from the Ag-Mature SBU Hazardous Waste Tank (SWMU 46) into a Tank Wagon (SWMU 185). There are no curbs or dikes around this unit. The run-off flows to a gravel pad which is adjacent to a drain which flows to the WWTP. The unit manages waste from SWMU 46.	Now an asphalt pad.	• No secondary containment and spill would flow to gravel pad adjacent to drain to WWTP, drain can be closed to prevent spills from entering and spill would stay in gravel • No relevant data.	3 borings VOCs SVOCs Metals Ammonia See Figure 8
79	Former PACM Unloading/ Loading Area	This unit is a 15 ft. wide by 30-ft. long concrete pad which was used for loading Tank Wagon (SWMU 185) with Bis (p-aminocyclohexyl) methane (PACM) waste. The pad does not have a dike or curb. The unit was last used in 1988, but is still in place.	Units were removed and the area is now being used for scaffold equipment storage. Area is covered with gravel lots and asphalt pads.	• No secondary containment • No relevant data	3 borings VOCs SVOCs Metals Ammonia See Figure 8
73 74 75 76	Former PACM Heel Tank No. 1 Heel Tank No. 2 Waste Tank No. 1 Waste Tank No. 2	There are four identical carbon steel, closed-top, 17,000-gallon units (SWMUs 73-76) which are used to accumulate waste from the PACM process. These units are each 9 ft. in diameter and 36 ft. tall. The tanks are mounted on steel legs on a small concrete foundation surrounded by gravel. The units ceased operation in 1988 and were cleaned out. The units were dismantled in 1998.	Tanks were removed and the area is now being used for scaffold equipment storage. Area is covered with gravel lots and asphalt pads.	• One release occurred • No secondary containment - concrete pad sloped towards trench on eastern side, but could drain to east into gravel • No relevant data	4 borings VOCs SVOCs Metals See Figure 8
80	PACM Area Trench and Sump System	This unit consisted of a series of concrete trenches and a concrete sump. The trenches were 18-inches wide and 6-12-inches deep. The sump was 5 ft. wide, 8 ft. long, and of unknown depth. The unit was used to collect process wastewater and run-off from the process area. The unit was closed and capped in 1998.	Units were removed and the area is now being used for scaffold equipment storage. Area is covered with gravel lots and asphalt pads.	• No closure documentation • Below ground	6 borings VOCs SVOCs Metals See Figure 8
86	Former C&P East Wastewater Stripper Tank	This unit is a vertical, 5,000-gallon carbon steel which stands on four steel leg supports about 3-feet above a concrete pad within a soil bottom containment dike. The unit ceased storing organic waste for offsite disposal in 1983.	In use, labeled as “4 Tank or 18 Tank.	• Secondary containment may not be reliable - tank located within a 2.5 ft high containment dike and the base of the area is soil and has a sump • No relevant data	2 borings VOCs SVOCs Metals See Figure 9

Table 1
Phase IV RFI Work Plan
DuPont Belle Plant, Belle West Virginia

SWMU/ AOC Number	SWMU/AOC Name	SWMU/AOC Description [from Current Conditions Report (1999)]	2012 SWMU/AOC Description	Investigation Rational Based on Decision Tree Evaluation	Proposed Investigation
41 A	Vazo Loading/Unloading Areas	There are two loading/unloading areas (Eastern and Western) in the Vazo Area. The eastern area is 40 ft. by 20 ft. and has a concrete surface. This area is used to load off-spec and product Vazo. The western area is a concrete pad that is 10 ft. wide, 50 ft. long and has 4 inch curbs on either side. This area is used to load tank wagons with 2-amino-2-methylpropanenitrile (AN) washings.	Active unit.	• Secondary containment not reliable - concrete pad with no berms, few areas of minor cracks • No relevant data	2 borings VOCs SVOCs Metals See Figure 10
64	Former MDA Tar Storage Tank	This unit was a vertical, flat bottom, 10,500-gallon capacity carbon steel tank. The tank was 10 ft. in diameter, 17 ft. tall and was located on a concrete pad. MDA Building 150 The unit was used to accumulate methylene dianiline tar from the MDA process. The tank will be dismantled in 1999.	Tank is gone. Area is now asphalt and gravel with a shed.	• Secondary containment may not be reliable - concrete berm and trench system has some cracks • Release not delineated	2 borings VOCs SVOCs Metals See Figure 10
67	Former MDA Trench and Sump System	The unit is a series of acid brick lined concrete trenches and sump. The trenches are 18 inches wide and 6 - 12 inches deep. The trenches all drain to a 6 ft. wide, 10 ft. long, and 15 ft. deep sump. The unit was used to collect process wastewater and run-off from the MDA process area. The unit was last used in 1988 prior to the shutdown of the MDA process.	Trench and sump system were removed. Area is now asphalt and gravel with a shed.	• No closure documentation • Below ground	3 borings VOCs SVOCs Metals See Figure 10
192	Inactive Disposal Area 9	This unit underlies 6-acres of the Main Process Area. Incinerator residue, organic waste, and lime were placed in the unit and covered with earth. The area is currently covered with gravel and asphalt.	Mostly a gravel covered area.	• No closure documentation • Below ground	12 borings (locations to be determined during the investigation based on accessible areas) VOCs SVOCs Metals Dioxins/Furan See Figure 11
160	WCS - North Flume	See SWMU 153	In limited use via black 16 inch pipe.	• Known releases • No relevant data	6 surface sediment samples VOCs SVOCs Metals See Figure 12
161	WCS - South Flume	See SWMU 153	Whole flume is in use.	• Known releases • No relevant data	3 surface sediment samples VOCs SVOCs Metals See Figure 12

Table 1
Phase IV RFI Work Plan
DuPont Belle Plant, Belle West Virginia

SWMU/ AOC Number	SWMU/AOC Name	SWMU/AOC Description [from Current Conditions Report (1999)]	2012 SWMU/AOC Description	Investigation Rational Based on Decision Tree Evaluation	Proposed Investigation
97	Methacrylate Trench and Sump System	This unit is a system of trenches and sumps which collects waste water from the Methacrylates area. The trenches vary in size and depth. The trenches discharge to sumps which discharge to the WWTP. The trenches and sumps are constructed of concrete and lined with acid brick.	In use.	• Below ground • Safe investigation is possible at this time	5 borings adjacent to trench VOCs SVOCs Metals See Figure 13
190	ACN Spill Tank	The unit is a closed, horizontal, carbon steel tank with a capacity of 10,350-gallons. The tank is suspended over Simmons Creek and is used to accumulate run-off water from the pad beneath the acetone cyanhydrin (ACN) manufacturing unit.	Tank was removed.	• No secondary containment - has high-level alarms and a high-level cutoff. • No relevant data	2 surface sediment samples downgradient of tank in Simmons Creek VOCs SVOCs See Figure 13
109	SLM Satellite Accumulation Areas	This unit is a 5 ft. by 1-ft. area of a larger concrete pad. The unit manages a 55-gallon container which stores sparkler filter solids from the Small Lots Manufacturing (SLM) Extractor Tank.	Not located in 2012, but located on map based on RFA description.	• Secondary containment may not be reliable – concrete base but no curbs • Relevant data - exceedances in groundwater nearby	1 surface soil sample VOCs SVOCs Metals Herbicides See Figure 13
53	Ag-Mature SBU Wet Benlate Trench and Sump System	This unit consists of a series of floor trenches and sumps which vary in size and construction. The trenches are covered with steel plate or gratings. The trenches are used to collect run-off and floor washing wastewater from the process areas and convey it to the sumps. All wastewater collected in the sumps is conveyed to the WWTP.	Appears functional, but not in use much.	• No closure documentation • Below ground	5 borings VOCs SVOCs Metals Herbicides See Figure 14
115	C&P West Trench and Sump System	This unit is a series of trenches and sumps which vary in size and construction materials. The trenches are covered with steel grates and/or boiler plates. This unit manages surface run-off.	Updated extensively and still in use.	• Below ground • Safe investigation is possible at this time	6 borings in gravel area VOCs SVOCs Metals Formaldehyde See Figure 14

Table 1
Phase IV RFI Work Plan
DuPont Belle Plant, Belle West Virginia

SWMU/ AOC Number	SWMU/AOC Name	SWMU/AOC Description [from Current Conditions Report (1999)]	2012 SWMU/AOC Description	Investigation Rational Based on Decision Tree Evaluation	Proposed Investigation
AOC F	AOC F Formaldehyde Spill	On August 8, 1983, approximately 4,000-lb. of a 56% formaldehyde solution was discharged to Simmons Creek. The spill was caused by the failure of a process pump.	Storm sewer discharge point located.	• This is an isolated spill of 56% formaldehyde solution due to an overflow in the pump containment system. • Spill material entered a storm sewer which discharged to Simmons Creek. • Sediments near the discharge point of the storm sewer into Simmons Creek will be sampled for evidence of the spill.	3 surface sediment samples Formaldehyde See Figure 14
189	Hexazinone Waste Brine Railcars	This unit consists of 10,000-gallon steel tankcars. The units are stored on the gravel railbed. The units are used to accumulate waste brine from the hexazinone intermediate process. Currently, only one tank car is used.	This SWMU is still active and only one tank car is being used. Spill containment is small spill control tub.	• Unreliable secondary containment – small spill control tub on train tracks • No relevant data	1 surface soil sample VOCs SVOCs Metals See Figure 15
58	Ag-Mature SBU Brine Treatment System-Ammonia Stripper	See SWMU 54. Stripper unit to remove ammonia	In use for extracting volatiles from our F3455 and AECP processes.	• Secondary containment may not be reliable – unit sits on gravel and mixed concrete/asphalt and has concrete curbs, spills would go to soil • No relevant data	3 borings VOCs SVOCs Metals Ammonia See Figure 16
93	SAR Furnace	This RCRA-regulated unit consists of a natural gas and waste fuel-fired combustion furnace. The furnace is used to burn and decompose methacrylate, spent acid, and polymers for the recovery of sulfuric acid.	Unit is being dismantled.	• Secondary containment may not be reliable - concrete pad only • No relevant data	3 borings VOCs SVOCs Metals Dioxins/Furan Soil pH See Figure 17
AOC G	AOC G Sulfuric Acid Spill	On November 9, 1988, approximately 3,000-lb. of sulfuric acid was discharged to the Kanawha River. The spill was caused by a leak in a heat exchanger in the Spent Acid Regeneration Plant.	Unit is being dismantled.	• Isolated spill of sulfuric acid to an asphalt area in the Spent Acid Regeneration Plant which then flowed to the Kanawha River. • Soil will be investigated at the edge of the asphalt pad.	4 surface soil samples Soil pH SVOCs Metals See Figure 17

Figures

Aerial Source: World Imagery provided via ESRI online at services.arcgisonline.com. Aerial Credit: ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGP.

N
W E
S

0 110 220 440

Feet

1 inch = 220 feet

MAP FORMATTED FOR "C" (17" X 22") SIZE SHEET.
TEXT SCALE NOT VALID FOR DIFFERENT PAGE SIZE.

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BELLE PLANT AREA - PHASE IV RFI INVESTIGATION AREAS

DUPONT BELLE PLANT
BELLE, WEST VIRGINIA

FILE NUMBER:	PROJECT NUMBER: 18986236
DESIGNED BY: DTL/KLD	DATE: 10/02/2012
DRAWN BY: CAA	FIGURE NUMBER: 1
DATA QUALITY CHECK BY: KLD	

Legend

- Proposed Soil Boring
- SWMU

Aerial Source: World Imagery provided via ESRI online at services.arcgisonline.com. Aerial Credit: ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGP.

N
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0 15 30 60

Feet

1 inch = 30 feet

MAP FORMATTED FOR "B" (11" X 17") SIZE SHEET.
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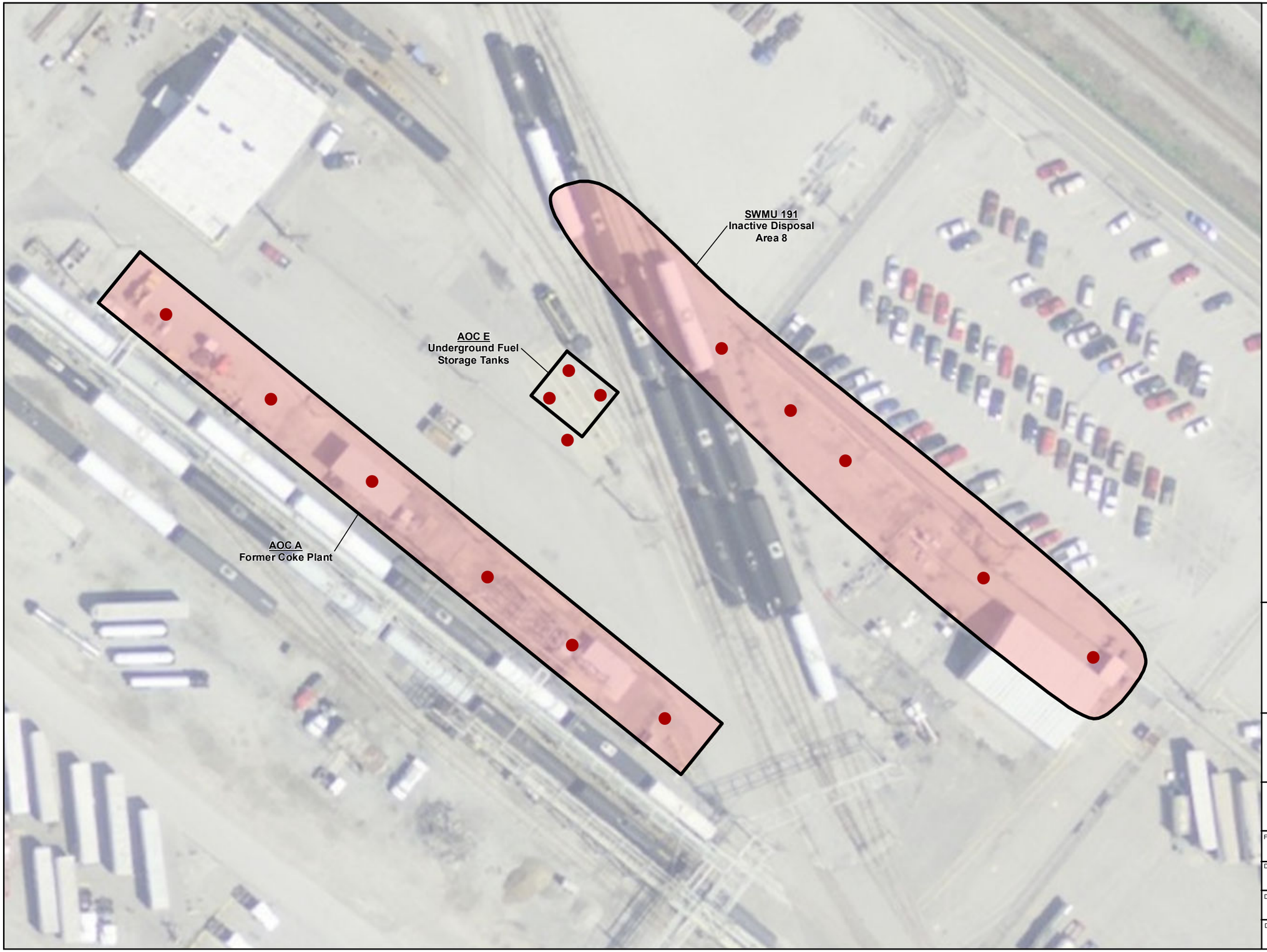
SWMU 54 - PROPOSED INVESTIGATION

DUPONT BELLE PLANT
BELLE, WEST VIRGINIA

FILE NUMBER:	PROJECT NUMBER: 18986236
DESIGNED BY: DTL/KLD	DATE: 09/27/2012
DRAWN BY: CAA	FIGURE NUMBER: 2
DATA QUALITY CHECK BY: KLD	



Legend

- Proposed Soil Boring
- SWMU or AOC

Aerial Source: World Imagery provided via ESRI online at services.arcgisonline.com. Aerial Credit: ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGP.

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0 25 50 100

Feet

1 inch = 50 feet

MAP FORMATTED FOR "B" (11" X 17") SIZE SHEET.
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SWMU 191, AOC E, AOC A - PROPOSED INVESTIGATIONS

DUPONT BELLE PLANT
BELLE, WEST VIRGINIA

FILE NUMBER:	PROJECT NUMBER: 18986236
DESIGNED BY: DTL/KLD	DATE: 09/27/2012
DRAWN BY: CAA	FIGURE NUMBER: 3
DATA QUALITY CHECK BY: KLD	

Legend

- Proposed Soil Boring
- SWMU

Aerial Source: World Imagery provided via ESRI online at services.arcgisonline.com. Aerial Credit: ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGP.

N W E S

0 15 30 60

Feet

1 inch = 30 feet

MAP FORMATTED FOR "B" (11" X 17") SIZE SHEET.
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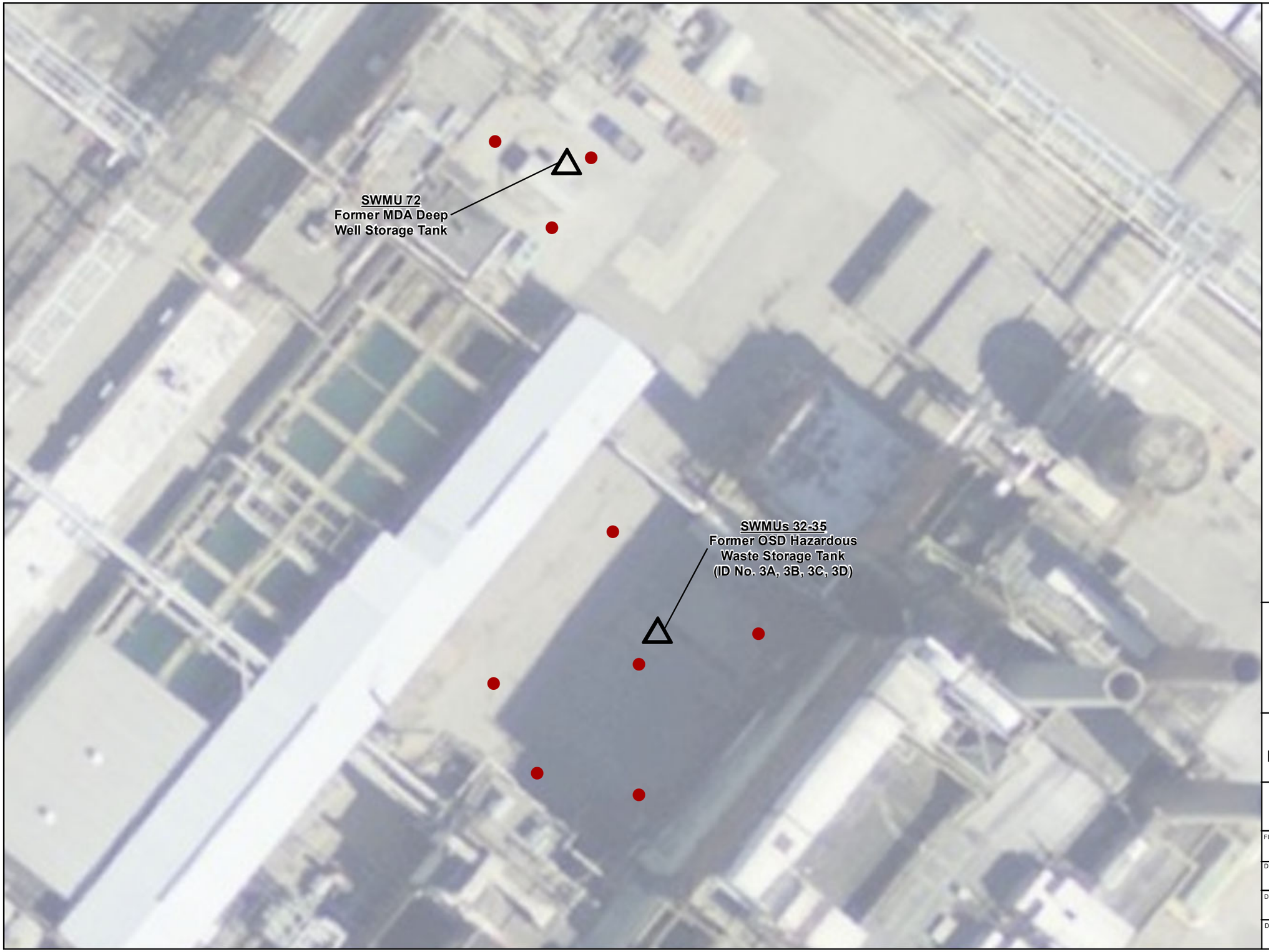
SWMUs 153, 155 - PROPOSED INVESTIGATIONS

DUPONT BELLE PLANT
BELLE, WEST VIRGINIA

FILE NUMBER:	PROJECT NUMBER: 18986236
DESIGNED BY: DTL/KLD	DATE: 09/27/2012
DRAWN BY: CAA	FIGURE NUMBER: 4
DATA QUALITY CHECK BY: KLD	



Legend

- Proposed Soil Boring
- SWMU

Aerial Source: World Imagery provided via ESRI online at services.arcgisonline.com. Aerial Credit: ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGP.

N
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0 15 30 60

Feet

1 inch = 30 feet

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SWMUs 32-35, 72 - PROPOSED INVESTIGATIONS

DUPONT BELLE PLANT
BELLE, WEST VIRGINIA

FILE NUMBER:	PROJECT NUMBER: 18986236
DESIGNED BY: DTL/KLD	DATE: 08/24/2012
DRAWN BY: CAA	FIGURE NUMBER: 5
DATA QUALITY CHECK BY: KLD	

Legend

- Proposed Soil Boring
- SWMU

Aerial Source: World Imagery provided via ESRI online at services.arcgisonline.com. Aerial Credit: ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGP.

N
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0 15 30 60

Feet

1 inch = 30 feet

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SWMU 151 - PROPOSED INVESTIGATION

DUPONT BELLE PLANT
BELLE, WEST VIRGINIA

FILE NUMBER:	PROJECT NUMBER: 18986236
DESIGNED BY: DTL/KLD	DATE: 09/27/2012
DRAWN BY: CAA	FIGURE NUMBER: 6
DATA QUALITY CHECK BY: KLD	

Legend

- Proposed Soil Boring for SWMU 122
- Proposed Soil Boring for SWMU 121
- Proposed Surficial Sediment Sample for SWMU 150
- SWMU

Aerial Source: World Imagery provided via ESRI online at services.arcgisonline.com. Aerial Credit: ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGP.

0 20 40 80

Feet

1 inch = 40 feet

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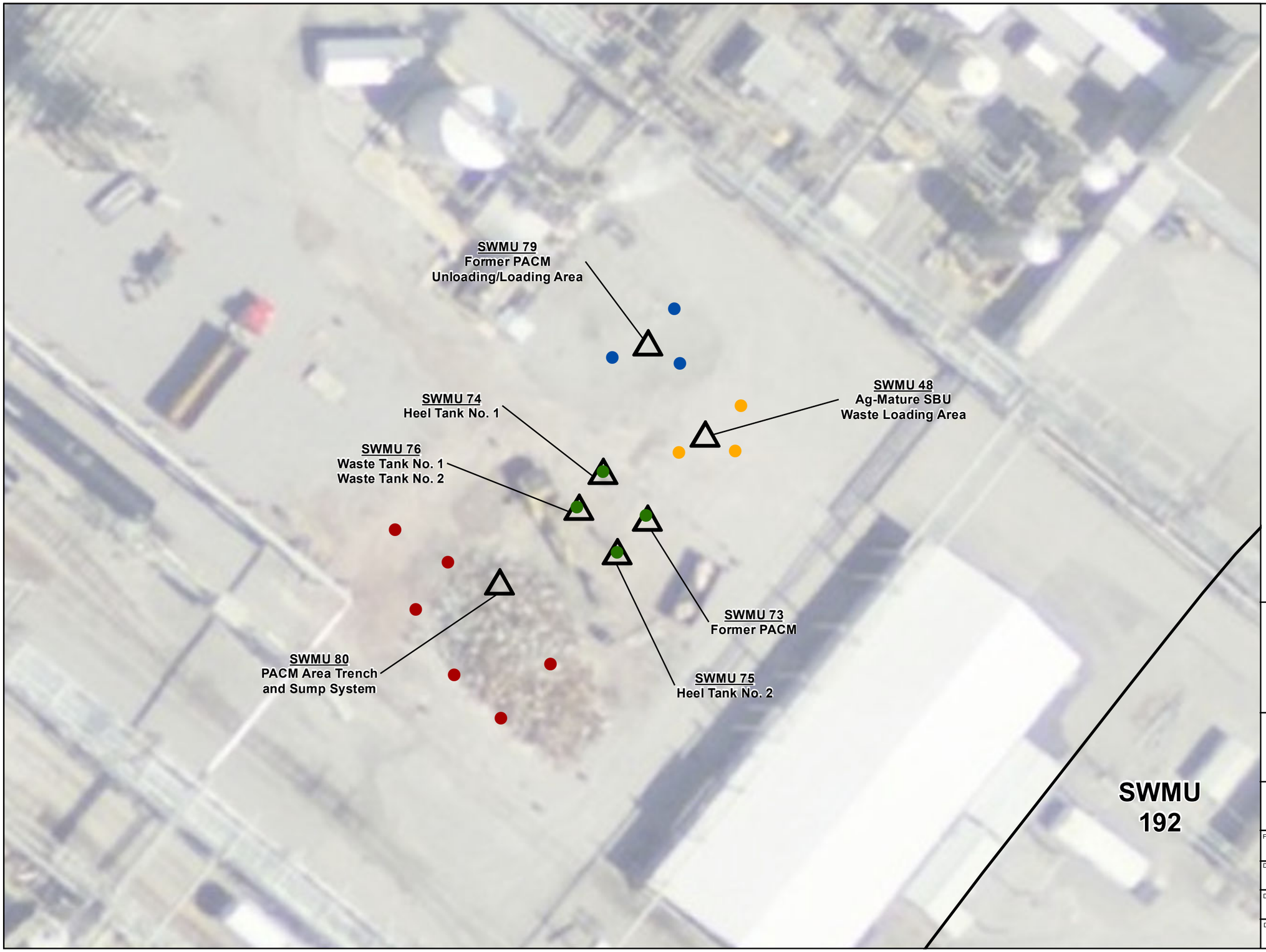
SWMUs 121, 122, 150 - PROPOSED INVESTIGATIONS

DUPONT BELLE PLANT
BELLE, WEST VIRGINIA

FILE NUMBER:	PROJECT NUMBER: 18986236
DESIGNED BY: DTL/KLD	DATE: 10/02/2012
DRAWN BY: CAA	FIGURE NUMBER: 7
DATA QUALITY CHECK BY: KLD	



Legend

- Proposed Soil Boring for SWMU 80
- Proposed Soil Boring for SWMUs 73-76
- Proposed Soil Boring for SWMU 79
- Proposed Soil Boring for SWMU 48
- SWMU
- SWMU 192

Aerial Source: World Imagery provided via ESRI online at services.arcgisonline.com. Aerial Credit: ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGP.

0 15 30 60

Feet

1 inch = 30 feet

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SWMUs 48, 73-76, 79, 80 - PROPOSED INVESTIGATIONS

DUPONT BELLE PLANT
BELLE, WEST VIRGINIA

FILE NUMBER:	PROJECT NUMBER: 18986236
DESIGNED BY: DTL/KLD	DATE: 10/02/2012
DRAWN BY: CAA	FIGURE NUMBER: 8
DATA QUALITY CHECK BY: KLD	

Legend

- Proposed Soil Boring
- SWMU
- SWMU 192

Aerial Source: World Imagery provided via ESRI online at services.arcgisonline.com. Aerial Credit: ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGP.

0 15 30 60

Feet

1 inch = 30 feet

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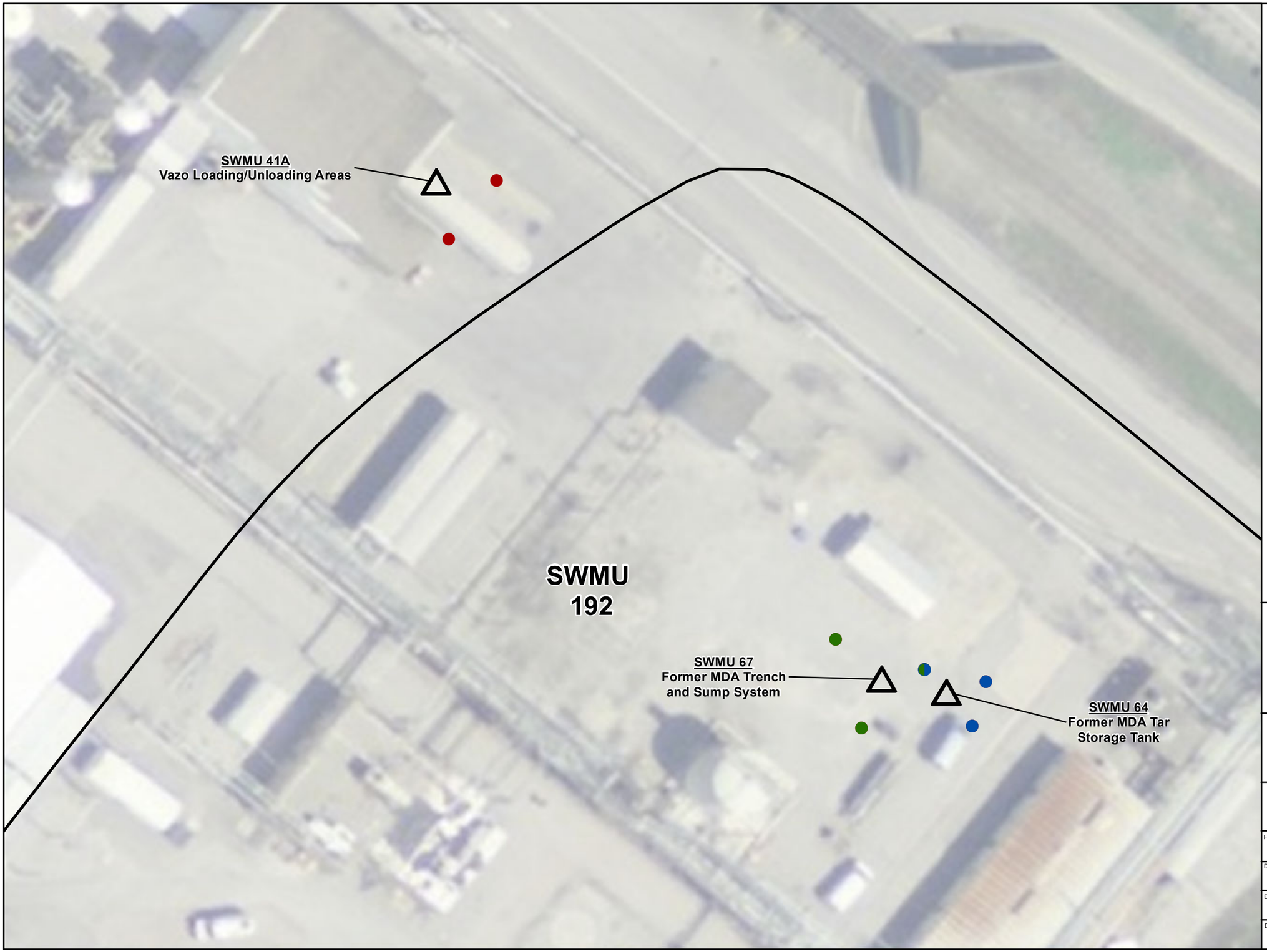
SWMU 86 - PROPOSED INVESTIGATION

DUPONT BELLE PLANT
BELLE, WEST VIRGINIA

FILE NUMBER:	PROJECT NUMBER: 18986236
DESIGNED BY: DTL/KLD	DATE: 08/24/2012
DRAWN BY: CAA	FIGURE NUMBER: 9
DATA QUALITY CHECK BY: KLD	



Legend

- Proposed Soil Boring for SWMU 41A
- Proposed Soil Boring for SWMU 67
- Proposed Soil Boring for SWMU 64
- Proposed Soil Boring for SWMUs 64, 67
- SWMU
- SWMU 192

Aerial Source: World Imagery provided via ESRI online at services.arcgisonline.com. Aerial Credit: ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGP.

0 15 30 60

Feet

1 inch = 30 feet

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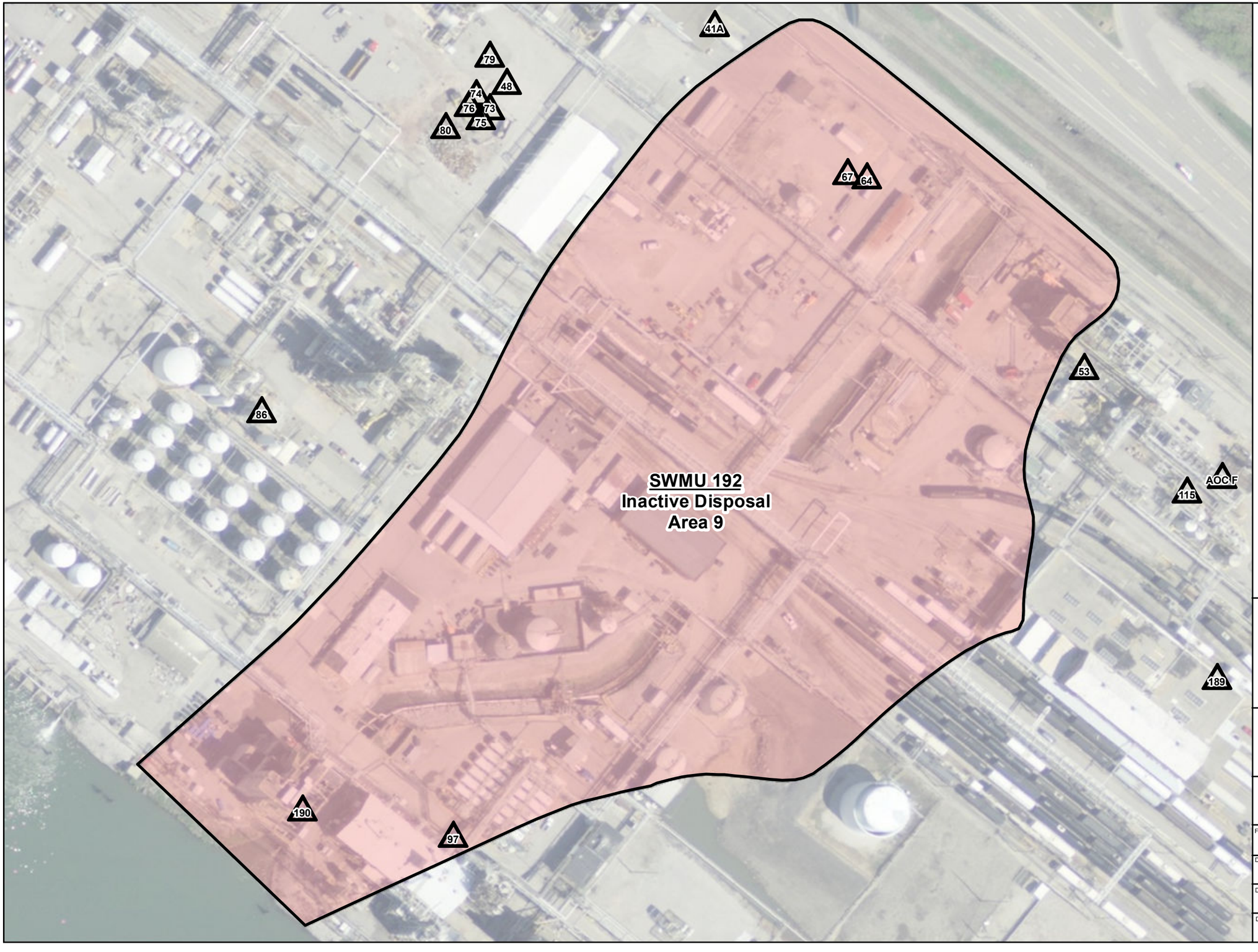
SWMUs 41A, 64, 67 - PROPOSED INVESTIGATIONS

DUPONT BELLE PLANT
BELLE, WEST VIRGINIA

FILE NUMBER:	PROJECT NUMBER: 18986236
DESIGNED BY: DTL/KLD	DATE: 08/24/2012
DRAWN BY: CAA	FIGURE NUMBER: 10
DATA QUALITY CHECK BY: KLD	



Legend

SWMU

SWMU 192

Note: Boring locations to be determined during the investigation based on field conditions.

Aerial Source: World Imagery provided via ESRI online at services.arcgisonline.com. Aerial Credit: ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGP.

0 50 100 200

Feet

1 inch = 100 feet

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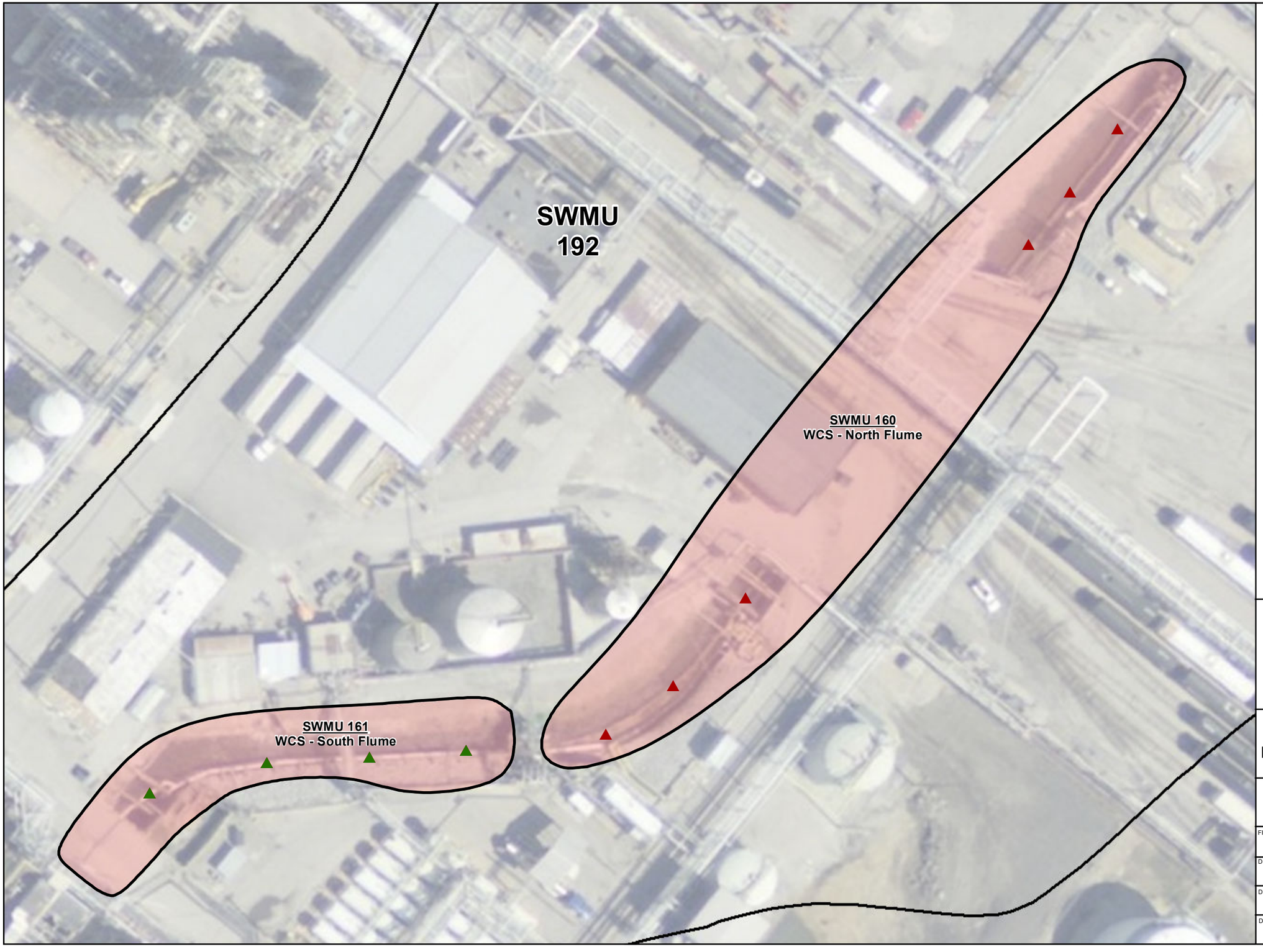
SWMU 192 - PROPOSED INVESTIGATION

DUPONT BELLE PLANT
BELLE, WEST VIRGINIA

FILE NUMBER:	PROJECT NUMBER: 18986236
DESIGNED BY: DTL/KLD	DATE: 08/24/2012
DRAWN BY: CAA	FIGURE NUMBER: 11
DATA QUALITY CHECK BY: KLD	



Legend

- Proposed Surficial Sediment Sample for SWMU 160
- Proposed Surficial Sediment Sample for SWMU 161
- SWMUs 160 and 161
- SWMU 192

Aerial Source: World Imagery provided via ESRI online at services.arcgisonline.com. Aerial Credit: ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGP.

N
W E
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0 25 50 100

Feet

1 inch = 50 feet

MAP FORMATTED FOR "B" (11" X 17") SIZE SHEET.
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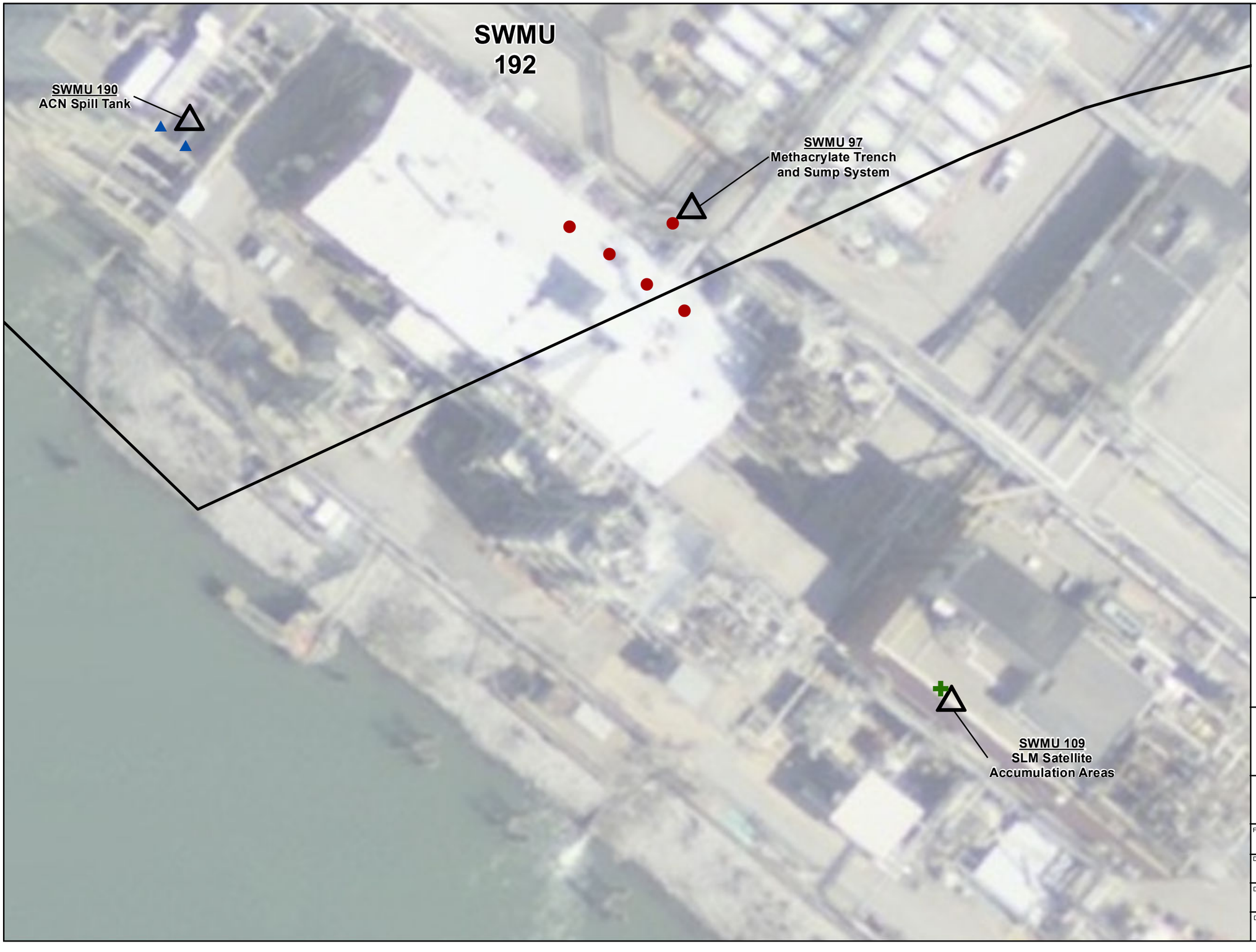
SWMUs 160, 161 - PROPOSED INVESTIGATIONS

DUPONT BELLE PLANT
BELLE, WEST VIRGINIA

FILE NUMBER:	PROJECT NUMBER: 18986236
DESIGNED BY: DTL/KLD	DATE: 09/27/2012
DRAWN BY: CAA	FIGURE NUMBER: 12
DATA QUALITY CHECK BY: KLD	



Legend

- Proposed Soil Boring for SWMU 97
- Proposed Surficial Soil Sample for SWMU 109
- Proposed Surficial Sediment Sample for SWMU 190
- SWMU
- SWMU 192

Aerial Source: World Imagery provided via ESRI online at services.arcgisonline.com. Aerial Credit: ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGP.

0 15 30 60

Feet

1 inch = 30 feet

MAP FORMATTED FOR "B" (11" X 17") SIZE SHEET.
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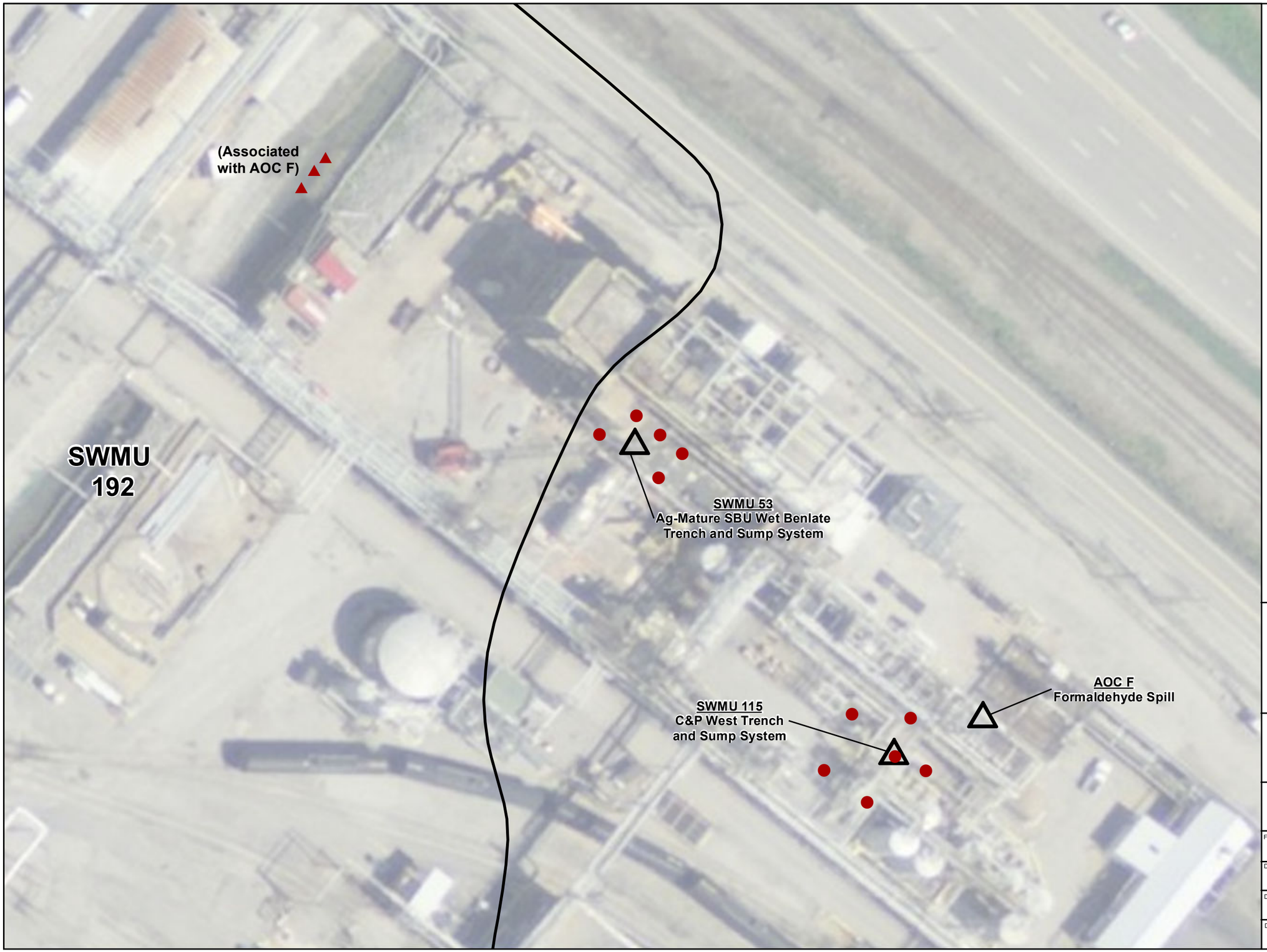
SWMUs 97, 109, AND 190 - PROPOSED INVESTIGATIONS

DUPONT BELLE PLANT
BELLE, WEST VIRGINIA

FILE NUMBER:	PROJECT NUMBER: 18986236
DESIGNED BY: DTL/KLD	DATE: 10/02/2012
DRAWN BY: CAA	FIGURE NUMBER: 13
DATA QUALITY CHECK BY: KLD	



Legend

- Proposed Soil Boring
- Proposed Surficial Sediment Sample
- SWMU
- SWMU 192

Aerial Source: World Imagery provided via ESRI online at services.arcgisonline.com. Aerial Credit: ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGP.

N
W E
S

0 20 40 80

Feet

1 inch = 40 feet

MAP FORMATTED FOR "B" (11" X 17") SIZE SHEET.
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SWMUs 53, 115, AOC F - PROPOSED INVESTIGATIONS

DUPONT BELLE PLANT
BELLE, WEST VIRGINIA

FILE NUMBER:	PROJECT NUMBER: 18986236
DESIGNED BY: DTL/KLD	DATE: 08/24/2012
DRAWN BY: CAA	FIGURE NUMBER: 14
DATA QUALITY CHECK BY: KLD	

Legend

Proposed Surficial Soil Sample

SWMU

Aerial Source: World Imagery provided via ESRI online at services.arcgisonline.com. Aerial Credit: ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGP.

N
W E
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0 15 30 60

Feet

1 inch = 30 feet

MAP FORMATTED FOR "B" (11" X 17") SIZE SHEET.
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SWMU 189 - PROPOSED INVESTIGATION

DUPONT BELLE PLANT
BELLE, WEST VIRGINIA

FILE NUMBER:	PROJECT NUMBER: 18986236
DESIGNED BY: DTL/KLD	DATE: 08/24/2012
DRAWN BY: CAA	FIGURE NUMBER: 15
DATA QUALITY CHECK BY: KLD	

Legend

- Proposed Soil Boring
- SWMU

Aerial Source: World Imagery provided via ESRI online at services.arcgisonline.com. Aerial Credit: ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGP.

N
W E
S

0 15 30 60

Feet

1 inch = 30 feet

MAP FORMATTED FOR "B" (11" X 17") SIZE SHEET.
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SWMU 58 - PROPOSED INVESTIGATION

DUPONT BELLE PLANT
BELLE, WEST VIRGINIA

FILE NUMBER:	PROJECT NUMBER: 18986236
DESIGNED BY: DTL/KLD	DATE: 08/24/2012
DRAWN BY: CAA	FIGURE NUMBER: 16
DATA QUALITY CHECK BY: KLD	

Legend

- Proposed Soil Boring
- Proposed Surficial Soil Sample
- SWMU

Aerial Source: World Imagery provided via ESRI online at services.arcgisonline.com. Aerial Credit: ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGP.

N
W E
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0 15 30 60

Feet

1 inch = 30 feet

MAP FORMATTED FOR "B" (11" X 17") SIZE SHEET.
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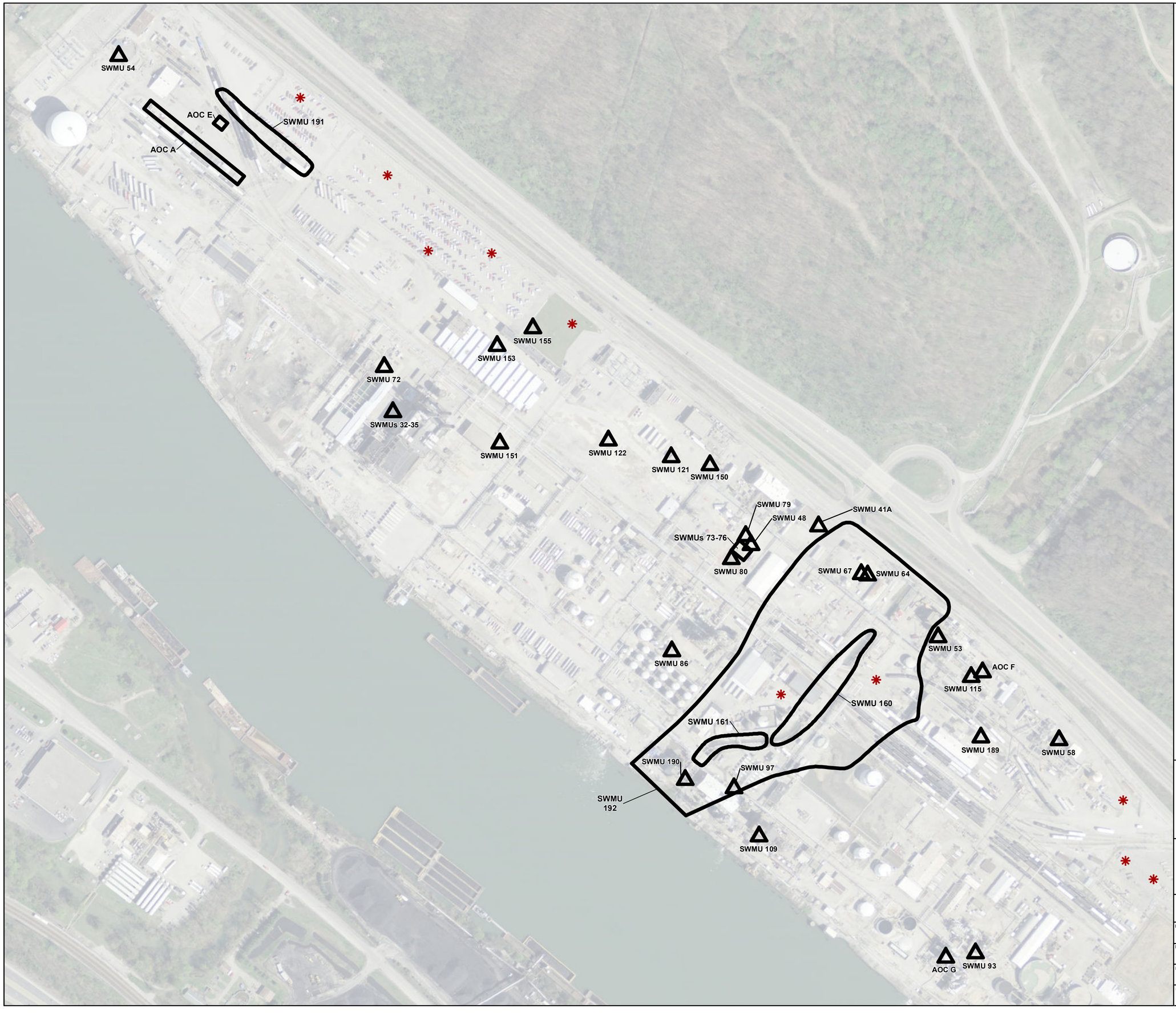
SWMU 93, AOC G - PROPOSED INVESTIGATIONS

DUPONT BELLE PLANT
BELLE, WEST VIRGINIA

FILE NUMBER:	PROJECT NUMBER: 18986236
DESIGNED BY: DTL/KLD	DATE: 09/27/2012
DRAWN BY: CAA	FIGURE NUMBER: 17
DATA QUALITY CHECK BY: KLD	



Legend

✱ Proposed Background Sample

Aerial Source: World Imagery provided via ESRI online at services.arcgisonline.com. Aerial Credit: ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGP.

N W E S

0 110 220 440

Feet

1 inch = 220 feet

MAP FORMATTED FOR "C" (17" X 22") SIZE SHEET.
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PROPOSED BACKGROUND SAMPLING LOCATIONS

DUPONT BELLE PLANT
BELLE, WEST VIRGINIA

FILE NUMBER:	PROJECT NUMBER: 18986236
DESIGNED BY: DTL/KLD	DATE: 10/02/2012
DRAWN BY: CAA	FIGURE NUMBER: 18
DATA QUALITY CHECK BY: KLD	

Appendices

Appendix A

Belle Plant Area SWMU and AOC Decision Tree Evaluation

URS

Memorandum

Date: October 2, 2012

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DuPont Project No.: 507878

URS Project No.: 18986236

Subject: **Belle Plant Area SWMU and AOC Decision Tree Evaluation and Results, DuPont Belle Site, Belle, West Virginia**

1.0 Introduction

This memorandum presents the decision tree evaluation approach that was used to objectively classify the status of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) located in the Plant Area of the DuPont Belle Site for purposes of developing the appropriate investigation scope for the upcoming Phase IV RFI. Based on this evaluation, the Plant Area SWMUs and AOCs were categorized as no further action, RFI complete and no further investigation required, or investigation deferred until a later time, or investigation to be proposed as part of the Phase IV RFI. A SWMU or AOC was placed in the investigation deferred category if an investigation is warranted, but cannot be safely completed at this time due to site operations. After the evaluation was completed, the Phase IV RFI work plan was developed for the Plant Area SWMUs and AOCs for which investigation is proposed at this time.

2.0 Belle Plant Area SWMU Decision Tree

A decision tree (Figure 1) was developed to objectively classify the status of SWMUs and AOCs located in the Plant Area of the DuPont Belle Site. In preparation for the Phase IV RFI, each of the SWMUs and AOCs at the plant was evaluated. During this evaluation, historical and current information were examined. Based on this evaluation, SWMUs and AOCs were either categorized as no further action, RFI complete and no further investigation required, investigation deferred, or investigation to be proposed. An explanation of the decision tree developed for SWMU and AOC classification is presented below. (Note that for simplicity, the decision tree only refers to SWMUs. However, the terms SWMU and AOC are interchangeable in the decision tree and in the discussions below.) Section 3.0 presents the results of the decision tree evaluation.

2.1 Belle Plant Area SWMU Decision Tree Development

In developing this decision tree for the Belle Plant Area SWMUs, several sources of information associated with the SWMUs were evaluated. The reviewed information included Table 3-1 and Table 8-1 of the *Current Conditions Report, DuPont Belle Plant, Belle West Virginia* (DuPont CRG, 1999). Table 3-1 (DuPont Belle Plant SWMU and AOC Descriptions) includes SWMU Number, SWMU

Location, Dates of Operation, and SWMU Description. This information was summarized from the DRAFT Phase II RCRA Facility Assessment (RFA; Kearney, 1991) and interviews with site personnel. In Table 3.1, the SWMU Description column describes the SWMU and summarizes the current closure status as of 1999. In some cases, a closure date and references to closure documentation are provided. Table 8-1 (DuPont Belle Plant SWMU and AOC Current Status) includes SWMU Number, SWMU Name, SWMU Location, Current Status and Comments. In the Comments column, summary information on known or suspected releases from the SWMUs through 1999 was presented along with relevant information such as observations made during earlier investigations, whether the unit has secondary containment and information on recent (as of 1999) inspections was provided. Other sources of information used in the development of this decision tree included:

- A series of SWMU Assessment Checklists and photographs from 1993-1994,
- Field observations and SWMU photographs generated during the 2012 field reconnaissance of the Belle Plant Area SWMUs, which show the SWMU location and the current use of the SWMU, or the area in which the SWMU was located if the SWMU no longer exists,
- Other sources of information on the current status of each SWMU gathered from plant personnel during the 2012 field reconnaissance,
- The database of analytical results for soil and groundwater samples from the Plant Area.

2.2 Belle Plant Area Decision Tree Description

As stated above, this decision tree was developed to objectively classify the Belle Plant Area SWMUs. The decision tree was designed to provide a process by which all SWMUs can be evaluated consistently while also taking into account all the differences in conditions of the SWMUs identified in the Plant Area. It is important to note that if uncertainly arises with regard to making a decision at any point in the evaluation of an individual SWMU, a conservative approach was utilized.

In the sections below, each decision point in the Belle Plant Area SWMU Decision Tree (Figure 1) is discussed and the possible outcomes are presented. Each subheading below represents one decision point, starting at the top of the decision tree and working down each path. Decision points in the Decision Tree are numbered 1 through 11 as indicated in Figure 1. This decision tree description starts with Decision Point #1 and follows the path on the left side of the decision tree.

1. Was the SWMU Previously Investigated?

Some Belle Plant Area SWMUs have been investigated previously under earlier phases of the RFI, under other programs, or during closure. If previous investigations were conducted, the path down the left side of the tree is followed.

2. Evidence of a Release?

If it has been determined that an investigation was conducted for a SWMU, then evidence of a release is evaluated next. Evidence of a release may include, but is not limited to:

- Visual observations made of an active or historic release, such as leaking fluids or stained surfaces.
- Documentation reporting a release.
- Data obtained in the investigation such as groundwater, soil or surface water, or rinsate results indicating a release.

Conversely, if documentation exists noting that no releases are known or suspected, such as soil or groundwater sampling results confirming the absence of SWMU related contaminants, then the answer to this question is no, there is no evidence of a release. Therefore, if the SWMU was previously investigated and no evidence of a release was found, then no further action is required for this SWMU.

3. Was Release Delineated?

If evidence of a release from a SWMU exists, the next decision point is to determine if the release has been delineated (Decision Point #3). A SWMU is considered to be delineated if the lateral and vertical extents of the release have been identified. Delineation may also be shown by way of confirmatory sampling results indicating that an impact no longer exists following a remedial activity. If the release has been delineated, then no further investigation is required for this SWMU and the RFI is considered complete. However, any SWMUs categorized as no further investigation will be carried forward in the Corrective Measures Study (CMS) and further evaluation of the SWMU may be conducted, if needed, during the CMS. If the release had not been delineated, the path joins the right side of the decision tree and will ultimately end up in either the “Investigation to be Proposed” box, or the “Investigation Deferred” box, depending on if it is safe to investigate at this time or not.

4. SWMU Status?

If the SWMU has not previously been investigated, then the current SWMU status is determined (Decision Point #4). SWMU status is either active or inactive. Active SWMUs are those still in use for the purpose described in the RFA (Kearney, 1991) in which the unit was designated as a SWMU. A SWMU is considered inactive if it meets any of the following conditions:

- The SWMU was closed, either formally with agency approval or informally without agency approval.
- The SWMU is out of use.
- The SWMU has been or is in the process of being dismantled or removed.
- The SWMU is in use for a purpose other than the purpose originally described in the RFA (Kearney, 1991).

Inactive SWMUs follow the path on the right of the decision tree to Decision Point #5, while active SWMUs follow the path in the center to Decision Point #6.

5. Closure Documentation Available?

If a SWMU is inactive, then the next step is to determine if closure documentation is available for RCRA-permitted SWMUs (Decision Point #5). Many of Belle Plant Area SWMUs were identified as being closed in the SWMU Description column of Table 3-1 or in the Current Status column in Table 8-1 of the *Current Conditions Report* (DuPont CRG, 1999). For some of the closed SWMUs, closure dates are provided in this table and in other cases, the table noted that closure reports are on file at the site. Some of these closure reports have been found in the site files. However, in many cases, closure documentation was not found. A search of appropriate West Virginia State Agency files was conducted and only a few additional closure reports were located. The Environmental Coordinator for the Belle Plant and the former coordinator were interviewed and confirmed that RCRA-regulated SWMUs were closed according to agency regulations. Based on this institutional knowledge, no further action is required for these SWMU. If no closure documentation was available or thought to exist, the pathway to Decision Point 6 was followed.

6. SWMU Location?

If the SWMU status has been identified as active, or closure documentation for an inactive SWMU does not exist, then the location of the SWMU with respect to the ground surface (above ground or below ground) is determined (Decision Point #6). Above ground SWMUs include all units which are positioned above the ground surface such as tanks, storage areas, loading and unloading areas, and boilers. Below ground SWMUs include those positioned below the ground surface and include units such as underground tanks, trenches, sumps, wastewater treatment lines, and injection wells. This distinction is important because it may not be possible to determine if a below ground SWMU has had a release or not, and typically, confirmatory sampling to verify no release has occurred is required for closure. However, with an above ground SWMU, evidence of a release, or evidence of no release, may be more easily observed or identified. Furthermore, closure of an above ground SWMU does not automatically require confirmatory sampling.

At this point in the decision tree, two very different paths are taken depending on if the SWMU is below ground or above ground. The above ground path is presented first.

7. Records Review Completed?

If a SWMU is located above ground, the next step focuses on reviewing all records available to see if evidence of a release exists (Decision Point #7).

Evidence of a release may include, but is not limited to:

- Visual observations made of an active or historic release, such as leaking fluids or stained surfaces,

- Documentation reporting a release,
- Analytical data such as groundwater, soil or surface water, or rinsate results indicating either a release or that no release has occurred.

Conversely, if no releases are known or suspected, such as indicated in the Comments column of Table 8-1 in the *Current Conditions Report* (DuPont CRG, 1999), then the answer to this question is no, there is no evidence of a release. If no evidence of a release exists, the path to the left is followed to the next decision point, which evaluates secondary containment (Decision Point #8). If a release is known or possible, the path is followed to the "Are there Relevant Data Available?" (Decision Point #9).

8. Reliable Secondary Containment?

If no evidence of a release exists for a SWMU, then the next decision point evaluates secondary containment for the SWMU (Decision Point #8). In many cases, the RFA (Kearney, 1991), the SWMU Assessment Checklists from 1993-1994, and Table 8-1 provide information on the existence and quality of secondary containment for a SWMU. If the secondary containment that exists is appropriate for the SWMU, is reliable, and would have prevented any releases from migrating out of the secondary containment, then the answer to this question is yes. In this evaluation, it was decided that if a SWMU is or was located within a building, the building itself acted as secondary containment, given that any releases from the SWMU inside a building would remain within the building and not migrate to soil or groundwater outside of the building. Trench and sump systems within a building, which may have provided secondary containment for SWMUs, will require safe investigation, when possible. If secondary containment is deemed reliable, then no further action is required for the SWMU. If there is no secondary containment or the secondary containment is deemed not reliable due to cracks or other such imperfections which may have allowed a release to migrate to the environment, then the path is followed to the "Are there Relevant Data Available?" (Decision Point #9).

9. Are There Relevant Data Available?

If the secondary containment for a SWMU is deemed not reliable or appropriate (as described above), or a possible or known release from a SWMU exists, then determining if relevant data exists that indicate whether a release has occurred or not is the next step.

Relevant data include:

- Analytical data such as groundwater, soil or surface water, or rinsate results indicating either a release or no evidence of a release,
- Confirmatory sampling results following a remedial activity either indicating no further evidence of a release,
- Documentation that a release has not been remediated or that remediation was deferred.

If relevant data do not exist, or relevant data show that a release exists that has not been delineated, the pathway to the "Is Safe Investigation Possible at this Time?" box is followed (Decision Point #11). If relevant data do exist and the data show that there is no release, or that the release had been remediated, then no further action is required.

10. Was the Release Delineated?

If the relevant data indicate a release, then delineation of the release is evaluated (Decision Point # 10). If the release has been delineated (Decision Point #10), the RFI for that SWMU is considered complete and no further investigation is required. However, any SWMUs categorized as no further investigation will be carried forward in the Corrective Measures Study (CMS) and further evaluation of the SWMU may be conducted, if needed, during the CMS. If the release has not been delineated, the pathway to decision point #11 is followed.

11. Is Safe Investigation Possible at this Time?

As stated above, below ground SWMUs include those located below the ground surface, which includes units such as trenches, sumps, wastewater treatment lines, and injection wells. If the active SWMU was located below the ground surface, the decision tree path is followed to the "Is Safe Investigation Possible at this Time?" box (Decision Point #11). In addition, for SWMUs from which a release exists, but has not been delineated, or where not enough information exists to determine if impacts exist or not, the path to the "Is Safe Investigation Possible at this Time?" box (Decision Point #11) is also followed.

If safe investigation is possible at this time, then an investigation is proposed in the Phase IV Work Plan. If safe investigation is not possible at this time due to site conditions in the area of the SWMU (such as active chemical operations, etc.), then the investigation of the SWMU will be deferred until such time that investigations can safely be conducted.

3.0 Belle Plant Area SWMU Decision Tree Evaluation Results

As stated above, this decision tree (Figure 1) was developed to objectively classify the Belle Plant Area SWMU. Based on this evaluation, SWMUs were categorized as no further action, RFI complete and no further investigation required, investigation to be proposed, or investigation deferred.

Table 1 provides the results of the decision tree evaluation for each of the SWMUs in the Belle Plant Area. This table includes the following information:

- SWMU Number – as identified in the RFA,
- SWMU Name,
- SWMU Description – a brief description of the SWMU operation and history (From the *Current Condition Report* (DuPont CRG, 1999)

- Comments [from the *Current Condition Report* (DuPont CRG, 1999) – copied from Table 8.1],
- 2012 Status – from the 2012 field reconnaissance,
- Decision Tree Evaluation Result,
- Investigation Rational – this indicates the decision point path followed, and provides the answers for each decision point and the investigation category determined.

In this evaluation, 184 SWMUs and AOCs in the Belle Plant Area were examined. Three of these (AOC A, SWMU 41 and SWMU 150) were classified into two categories due to specific circumstances, as indicated in Table 1. The following results were determined for each category:

- No Further Action – 131 SWMUs and AOCs
- No Further Investigation – Two AOCs
- Investigation Deferred – 15 SWMUs
- Investigation to be Proposed – 39 SWMUs and AOCs

Figure 2 provides the locations of each SWMU or AOC and shows in which category each was placed. SWMUs and AOCs in the Investigation to be Proposed category were carried forwards in the Phase IV RFI Work Plan.

Table 1
Belle SWMUs Summary Information
DuPont Belle Plant, Belle West Virginia

SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
32	Former OSD Hazardous Waste Storage Tank (ID No. 3A)	These units consisted of four tanks (SWMUs 32-35) that were used to store wastes generated onsite prior to burning at the OSD Coal/Waste-Fired Boilers. The units were above ground tanks (varying in size) which were constructed on gravel pads. After removal of the fourth tank, some staining was noticed. Gravel and soil was removed. These units were closed in 1981 without an approved closure plan. The facility was fined for closing these units without an approved closure plan. However, no additional remedial activities were required for the unit by either the EPA Region III or WVDNR.	1999 - Several small spills occurred during closure activities. Approximately 800 cubic yards of impacted gravel and soil were removed from the site during closure. No evidence of a release was observed during VSI.	Tanks gone. Asphalt parking with some new infrastructure. Have photo.	Investigation to be Proposed	1. SWMU Not Previously Investigated 4. Inactive (removed) 5. Closed without an approved closure plan 6. Above Ground 7. Release known at fourth tank, 800 cubic yards of impacted soil/gravel removed 9. No Relevant Data - no confirmatory sampling 11. Safe Investigation is Possible at this Time Investigation to be Proposed
33	Former OSD Hazardous Waste Storage Tank (ID No. 3B)	See SWMU 32	1999 - See SWMU 32.	Tanks gone. Asphalt parking with some new infrastructure.	Investigation to be Proposed	1. SWMU Not Previously Investigated 4. Inactive (removed) 5. Closed without an approved closure plan 6. Above Ground 7. Release known at fourth tank, 800 cubic yards of impacted soil/gravel removed 9. No Relevant Data - no confirmatory sampling 11. Safe Investigation is Possible at this Time Investigation to be Proposed
34	Former OSD Hazardous Waste Storage Tank (ID No. 3C)	See SWMU 32	1999 - See SWMU 32.	Tanks gone. Asphalt parking with some new infrastructure.	Investigation to be Proposed	1. SWMU Not Previously Investigated 4. Inactive (removed) 5. No Closure Documentation 6. Above Ground 7. Release known at fourth tank, 800 cubic yards of impacted soil/gravel removed 9. No Relevant Data - no confirmatory sampling 11. Safe Investigation is Possible at this Time Investigation to be Proposed
35	Former OSD Hazardous Waste Storage Tank (ID No. 3D)	See SWMU 32	1999 - See SWMU 32.	Tanks gone. Asphalt parking with some new infrastructure.	Investigation to be Proposed	1. SWMU Not Previously Investigated 4. Inactive (removed) 5. Closed without an approved closure plan 6. Above Ground 7. Release known at fourth tank, 800 cubic yards of impacted soil/gravel removed 9. No Relevant Data - no confirmatory sampling 11. Safe Investigation is Possible at this Time Investigation to be Proposed

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Belle SWMUs Summary Information
DuPont Belle Plant, Belle West Virginia

SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
41 (41A and 41B)	Vazo Loading/Unloading Areas	There are two loading/unloading areas (Eastern and Western) in the Vazo Area. The eastern area is 40 ft. by 20 ft. and has a concrete surface. This area is used to load off-spec and product Vazo. The western area is a concrete pad that is 10 ft. wide, 50 ft. long and has 4 inch curbs on either side. This area is used to load tank wagons with AN washings.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI other than minor staining in the western unit. Unit receives quarterly inspections.	Active unit. Have photos 41A and 41B.	Investigation to be Proposed for 41A and No Further Action for 41B	1. SWMU Not Previously Investigated 4. Active 6. Above Ground 7. No Release 8. Secondary Containment Not Reliable - 41A has a concrete pad with no berms, few areas of minor cracks Reliable Secondary Containment - 41B has a concrete pad with curbs and which slopes to a drain and sump which goes to SWMU 36 9. No Relevant Data - No nearby samples for 41A 11. Safe Investigation is Possible at this Time for 41B Investigation to be Proposed for 41A and No Further Action for 41B
48	Ag-Mature SBU Waste Loading Area	The unit is a 30 ft. long, 10 ft. wide asphalt pad. The unit is used for loading waste from the Ag-Mature SBU Hazardous Waste Tank (SWMU 46) into a Tank Wagon (SWMU 185). There are no curbs or dikes around this unit. The run-off flows to a gravel pad which is adjacent to a drain which flows to the WWTP. The unit manages waste from SWMU 46.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR.	Now an asphalt pad. Have photo.	Investigation to be proposed	1. SWMU Not Previously Investigated 4. Inactive 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Secondary Containment Not Reliable - No Secondary Containment and would flow to gravel pad adjacent to drain to WWTP, drain can be closed to prevent spills from entering and spill would stay in gravel 9. No Relevant Data - One nearby upgradient soil/GW sample (HP-4) soil had one low level exceedance SVOC, GW had two pesticide exceedances (heptachlor and phorate). 11. Safe Investigation is Possible at this Time Investigation to be proposed
53	Ag-Mature SBU Wet Benlate Trench and Sump System	This unit consists of a series of floor trenches and sumps which vary in size and construction. The trenches are covered with steel plate or gratings. The trenches are used to collect run-off and floor washing wastewater from the process areas and convey it to the sumps. All wastewater collected in the sumps is conveyed to the WWTP.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit receives quarterly inspections.	Appears functional, but not in use much. Have photo.	Investigation to be Proposed	1. SWMU Not Previously Investigated 4. Active 5. No Closure Documentation 6. Below Ground 11. Safe Investigation is Possible at this Time Investigation to be Proposed
54	Ag-Mature SBU Brine Treatment System-Former Raw Waste Storage Tank	The Ag-Mature Brine Treatment System consists of SWMUs 54-62. The system is used to treat waste brine generated during the manufacture of an agricultural fungicide.	1999 - No releases at these SWMUs are known or suspected. No evidence of a release observed during VSI or PR.	Tank was removed. Only the pad remains. Have photo.	Investigation to be Proposed	1. SWMU Not Previously Investigated 4. Inactive (removed) 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Secondary Containment May Not be Reliable – gravel pad and a gravel soil berm, some concrete wall 9. No Relevant Data 11. Safe Investigation is Possible at this Time Investigation to be Proposed

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Belle SWMUs Summary Information
DuPont Belle Plant, Belle West Virginia

SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
58	Ag-Mature SBU Brine Treatment System-Ammonia Stripper	See SWMU 54	1999 - No releases at these SWMUs are known or suspected. No evidence of a release observed during VSI or PR.	In use for something. Have photo.	Investigation to be proposed	1. SWMU Not Previously Investigated 4. Inactive (in use for something) 5. No Closure Documentation 6. Above Ground 7. No Release 8. Secondary Containment may Not be Reliable – unit sits on gravel and mixed concrete/asphalt and has concrete curbs, spills would go to soil 9. No Relevant Data 11. Safe Investigation is Possible at this Time Investigation to be Proposed
64	Former MDA Tar Storage Tank	This unit was a vertical, flat bottom, 10,500-gallon capacity carbon steel tank. The tank was 10 ft. in diameter, 17 ft. tall and was located on a concrete pad. MDA Building 150 The unit was used to accumulate methylene dianiline tar from the MDA process. The tank will be dismantled in 1999.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Closure information is on file at the plant.	Tank is gone. Area is now asphalt and gravel with a shed. Have photo.	Investigation to be Proposed	1. SWMU Not Previously Investigated 4. Inactive (removed) 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Secondary Containment May Not be Reliable - concrete berm and trench system has some cracks 9. Relevant Data Exist (downgradient samples HP-70, MDA-HP-4, MW-70-SO, T and D metal exceedances, several other exceedances) 10. Release Not Delineated Investigation to be Proposed
67	Former MDA Trench and Sump System	The unit is a series of acid brick lined concrete trenches and sump. The trenches are 18 inches wide and 6 - 12 inches deep. The trenches all drain to a 6 ft. wide, 10 ft. long, and 15 ft. deep sump. The unit was used to collect process wastewater and run-off from the MDA process area. The unit was last used in 1988 prior to the shutdown of the MDA process.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Information on partial closure is on file.	Trench and sump system were removed. Area is now asphalt and gravel with a shed. Have photo.	Investigation to be Proposed	1. SWMU Not Previously Investigated 4. Inactive (removed) 5. No Closure Documentation 6. Below Ground 11. Safe Investigation is Possible at this Time Investigation to be Proposed
72	Former MDA Deep Well Storage Tank	This unit is a 110,000-gallon, stainless steel tank. The unit is 25 ft. in diameter and 30 ft. tall. The tank is above ground on a concrete pad, surrounded by gravel, with no secondary containment. This unit was used to store adipic acid waste and later to accumulate waste brine from the MDA process. The unit is no longer in service, but is still in place	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit has no secondary containment.	Tank was removed. Concrete pad now has a shed on it. Have photo.	Investigation to be proposed	1. SWMU Not Previously Investigated 4. Inactive 5. No Closure Documentation 6. Above Ground 7. No Releases 8. No Secondary Containment 9. No Relevant Data 11. Safe Investigation is Possible at this Time Investigation to be Proposed

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Belle SWMUs Summary Information
DuPont Belle Plant, Belle West Virginia

SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
73	Former PACM Heel Tank No. 1	There are four identical carbon steel, closed-top, 17,000-gallon units (SWMUs 73-76) which are used to accumulate waste from the PACM process. These units are each 9 ft. in diameter and 36 ft. tall. The tanks are mounted on steel legs on a small concrete foundation which is surrounded by gravel. The units ceased operation in 1988 and were cleaned out. The units were dismantled in 1998.	1999 - There is only one known release from these units. In 1983, 1,000 lb. of wastes were released to the soil from SWMU 74. The spilled waste solidified immediately and was shoveled into drums and disposed of off-site. There was no secondary containment for these units. Closure information is on file.	Tanks were removed and the area is now being used for scaffold equipment storage. Area is covered with gravel lots and asphalt pads. Have photo.	Investigation to be proposed	1. SWMU Not Previously Investigated 4. Inactive 5. No Closure Documentation 6. Above Ground 7. One Release Occurred and No Secondary Containment - concrete pad sloped towards trench on eastern side, but could drain to east into gravel 9. No Relevant Data 11. Safe Investigation is possible at this Time Investigation to be Proposed
74	Former PACM Heel Tank No. 2	See SWMU 73	1999 - See SWMU 73.	See SWMU 73.	Investigation to be proposed	1. SWMU Not Previously Investigated 4. Inactive 5. No Closure Documentation 6. Above Ground 7. One Release Occurred and No Secondary Containment - concrete pad sloped towards trench on eastern side, but could drain to east into gravel 9. No Relevant Data 11. Safe Investigation is possible at this Time Investigation to be Proposed
75	Former PACM Waste Tank No. 1	See SWMU 73	1999 - See SWMU 73.	See SWMU 73.	Investigation to be proposed	1. SWMU Not Previously Investigated 4. Inactive 5. No Closure Documentation 6. Above Ground 7. One Release Occurred and No Secondary Containment - concrete pad sloped towards trench on eastern side, but could drain to east into gravel 9. No Relevant Data 11. Safe Investigation is possible at this Time Investigation to be Proposed
76	Former PACM Waste Tank No. 2	See SWMU 73	1999 - See SWMU 73.	See SWMU 73.	Investigation to be proposed	1. SWMU Not Previously Investigated 4. Inactive 5. No Closure Documentation 6. Above Ground 7. One Release Occurred and No Secondary Containment - concrete pad sloped towards trench on eastern side, but could drain to east into gravel 9. No Relevant Data 11. Safe Investigation is possible at this Time Investigation to be Proposed
79	Former PACM Unloading/ Loading Area	This unit is a 15 ft. wide by 30-ft. long concrete pad which was used for loading Tank Wagon (SWMU 185) with PACM waste. The pad does not have a dike or curb. The unit was last used in 1988, but is still in place.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit had no secondary containment.	Units were removed and the area is now being used for scaffold equipment storage. Area is covered with gravel lots and asphalt pads. Have photo.	Investigation to be proposed	1. SWMU Not Previously Investigated 4. Inactive, but active WWTP tank is in the location 5. No Closure Documentation 6. Above Ground 7. No Releases 8. No Secondary Containment 9. No Relevant Data 11. Safe Investigation is possible at this Time Investigation to be Proposed

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DuPont Belle Plant, Belle West Virginia

SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
80	PACM Area Trench and Sump System	This unit was consisted of a series of concrete trenches and a concrete sump. The trenches were 18-inches wide and 6-12-inches deep. The sump was 5 ft. wide, 8 ft. long, and of unknown depth. The unit was used to collect process wastewater and run-off from the process area. The unit was closed and capped in 1998.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR.	Units were removed and the area is now being used for scaffold equipment storage. Area is covered with gravel lots and asphalt pads. Have photo.	Investigation to be proposed	1. SWMU Not Previously Investigated 4. Inactive 5. No Closure Documentation 6. Below Ground 11. Safe Investigation is possible at this Time Investigation to be Proposed
86	Former C&P East Wastewater Stripper Tank	This unit is a vertical, 5,000-gallon carbon steel which stands on four steel leg supports about 3-feet above a concrete pad within a soil bottom containment dike. The unit ceased storing organic waste for offsite disposal in 1983.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit had good secondary containment.	In use, labeled as “4 Tank or 18 Tank. Have photo.	Investigation to be Proposed	1. SWMU Not Previously Investigated 4. Active 6. Above Ground 7. No Releases 8. Secondary Containment may Not be Reliable - tank located within a 2.5 ft high containment dike and the base of the area is soil and has a sump 9. No Relevant Data 11. Safe Investigation is Possible at this Time. Investigation to be Proposed
93	SAR Furnace	This RCRA-regulated unit consists of a natural gas and waste fuel-fired combustion furnace. The furnace is used to burn and decompose methacrylate, spent acid, and polymers for the recovery of sulfuric acid.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR.	Unit is being dismantled. Have photo.	Investigation to be Proposed	1. SWMU Not Previously Investigated 4. Closed and being dismantled 5. No Closure Documentation Located Above Ground 7. No Releases 8. Secondary Containment may Not be Reliable – furnace is located on a concrete pad with no secondary containment 9. No Relevant Data 11. Safe Investigation is Possible at this Time. Investigation to be Proposed
97	Methacrylate Trench and Sump System	This unit is a system of trenches and sumps which collects waste water from the Methacrylates area. The trenches vary in size and depth. The trenches discharge to sumps which discharge to the WWTP. The trenches and sumps are constructed of concrete and lined with acid brick.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR.	In use. Have photo.	Investigation to be Proposed	1. SWMU Not Previously Investigated 4. Active 6. Below Ground 11. Safe Investigation is not Possible at this Time Investigation to be Proposed
109	SLM Satellite Accumulation Areas	This unit is a 5 ft. by 1-ft. area of a larger concrete pad. The unit manages a 55-gallon container which stores sparkler filter solids from the SLM Extractor Tank.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR.	Not located in 2012.	Investigation to be Proposed	1. SWMU Not Previously Investigated 4. Inactive 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Secondary Containment may Not be Reliable – concrete base but no curbs 9. Relevant Data - many exceedances in groundwater nearby Investigation to be Proposed

Table 1
Belle SWMUs Summary Information
DuPont Belle Plant, Belle West Virginia

SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
115	C&P West Trench and Sump System	This unit is a series of trenches and sumps which vary in size and construction materials. The trenches are covered with steel grates and/or boiler plates. This unit manages surface run-off.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit receives quarterly inspections.	Updated extensively and still in use. Have photo.	Investigation to be Proposed	1. SWMU Not Previously Investigated 4. Active 6. Below Ground 11. Safe Investigation is Possible at this Time Investigation to be Proposed
121	HCO Oil Storage Tank	This unit was a 5,390-gallon, flat bottom, carbon steel tank which rested on a concrete pad. The tank was 7.5 ft. in diameter, and 15.5-ft. tall with a closed top. The unit managed waste oil from the HCO Oil/Water Separator.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit had good secondary containment.	Area is a small gravel lot with a pipe rack and small metal building on it. Have photo.	Investigation to be proposed	1. SWMU Not Previously Investigated 4. Inactive and removed 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Secondary Containment may not be Reliable – asphalt pavement with no curbs and high-level alarm 9. No relevant Data 11. Safe Investigation is Possible at this Time Investigation to be Proposed
122	HCO Waste Lubricating Oil Collection Sumps	This unit consisted of collection sumps which received waste oil and water from the compressors. The sump tanks were constructed of steel and have a 400-gallon capacity.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR.	Building dismantled and SWMU no longer exists and area is covered by gravel. Have photo.	Investigation to be proposed	1. SWMU Not Previously Investigated 4. Inactive and removed 5. No Closure Documentation 6. Below Ground 11. Safe Investigation is Possible at this Time Investigation to be Proposed
150	WCS #11 Pumping Station	See SWMU 145	1999 - See SWMU 145.	In use and upgraded. Have photo. See SWMU 145. Mercury has been identified in drains and traps of the Control Lab which may have occurred during operations and waste practice at the Control Lab. Sediments within SWMU 150 may have been impacted by the release.	Investigation Deferred and Investigation to be Proposed	1. SWMU Not Previously Investigated 4. Active 6. Below Ground 7. Known releases 9. No Relevant Data 11. Safe Investigation not Possible at this Time Investigation Deferred until Unit is inactive Investigation to be Proposed for the sediments within SWMU 150 based on knowledge of a release within the Control Lab.
151	WCS Pumping Station	See SWMU 145	1999 - See SWMU 145.	Have photo. See SWMU 145	Investigation to be Proposed	1. SWMU Not Previously Investigated 4. Active 6. Below Ground 7. Known releases 9. No Relevant Data 11. Safe Investigation is Possible at this Time Investigation to be Proposed

Table 1
Belle SWMUs Summary Information
DuPont Belle Plant, Belle West Virginia

SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
153	WCS Pumping Station	See SWMU 145	1999 - See SWMU 145.	Location on map corrected. Have photo. See SWMU 145	Investigation to be Proposed	1. SWMU Not Previously Investigated 4. Active 6. Below Ground 7. Known releases 9. No Relevant Data 11. Safe Investigation is Possible at this Time Investigation to be Proposed
155	WCS Pumping Station	See SWMU 145	1999 - See SWMU 145.	Have photo. See SWMU 145	Investigation to be Proposed	1. SWMU Not Previously Investigated 4. Active 6. Below Ground 7. Known releases 9. No Relevant Data 11. Safe Investigation is Possible at this Time Investigation to be Proposed
160	WCS - North Flume	See SWMU 145	1999 - See SWMU 145.	In limited use via black 16 inch pipe. Have photo. See SWMU 145	Investigation to be Proposed	1. SWMU Not Previously Investigated 4. Active 6. Below Ground 7. Known releases 9. No Relevant Data 11. Safe Investigation is Possible at this Time Investigation to be Proposed
161	WCS - South Flume	See SWMU 145	1999 - See SWMU 145.	Whole flume is in use. Have photo. See SWMU 145	Investigation to be Proposed	1. SWMU Not Previously Investigated 4. Active 6. Below Ground 7. Known releases 9. No Relevant Data 11. Safe Investigation is Possible at this Time Investigation to be Proposed
189	Hexazinone Waste Brine Railcars	This unit consists of 10,000-gallon steel tankcars. The units are stored on the gravel railbed. The units are used to accumulate waste brine from the hexazinone intermediate process. Currently, only one tank car is used.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. New Spill containment.	This SWMU is still active and only one tank car is being used. Spill containment is small spill control tub. Have photo	Investigation to be Proposed	1. SWMU Not Previously Investigated 4. Active 6. Above Ground 7. No Releases 8. Unreliable Secondary Containment – small spill control tub on train tracks 9. No Relevant Data 11. Safe Investigation is Possible at this Time Investigation to be proposed
190	ACN Spill Tank	The unit is a closed, horizontal, carbon steel tank with a capacity of 10,350-gallons. The tank is suspended over Simmons Creek and is used to accumulate run-off water from the pad beneath the acetone cyanhydrin manufacturing unit.	1999 - No releases at this SWMU are known or suspected. Unit not inspected during VSI or PR.	Tank was removed. Have photo.	Investigation to be Proposed	1. SWMU Not Previously Investigated 4. Inactive and removed 5. No Closure Documentation 6. Above Ground 7. No Releases 8. No Secondary Containment - has high-level alarms and a high-level cutoff. 9. No Relevant Data 11. Safe Investigation is Possible at this Time Investigation to be Proposed

Table 1
Belle SWMUs Summary Information
DuPont Belle Plant, Belle West Virginia

SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
191	Inactive Disposal Area 8	This unit is a 1.5-acre area where coal fired boiler ash and coke fines were used as above-grade fill material. The depth of the material is not known. The area is now covered with gravel or asphalt and used as a parking area, rail yard, and SSS Area waste storage tank area.	1999 - This unit is an area where coal fired boiler ash and coke fines were used as above-grade fill material. The depth of the material is not known.	Area is now paved parking lots used for trailer parking. Have photo.	Investigation to be Proposed	1. SWMU Not Previously Investigated 4. Inactive and paved 5. No Closure Documentation 6. Below Ground Investigation to be proposed
192	Inactive Disposal Area 9	This unit underlies 6-acres of the Main Process Area. Incinerator residue, organic waste, and lime were placed in the unit and covered with earth. The area is currently covered with gravel and asphalt.	1999 - Incinerator residue, organic waste, and lime were placed directly on the ground surface in the unit and covered with earth.	Mostly a gravel covered area.	Investigation to be Proposed	1. SWMU Not Previously Investigated 4. Inactive (paved) 5. No Closure Documentation 6. Below Ground Investigation to be proposed
AOC A	AOC A Former Coke Plant and Benzol Process Area	All buildings and support equipment associated with the Coke plant and Benzol Process Area have been removed. Wastes generated in the coking process were used as fill material in the southwest portion of the plant. The operation of the Former Coke Plant and the Benzol Area are considered to be the source of volatile organics detected in the Southwest Ground Water Seep (AOC B).	1999 - Wastes generated in the coking process were used as fill material in the southwest portion of the plant. The operation of the Former Coke Plant and the Benzol Area are considered to be the source of volatile organics detected in the Southwest Ground Water Seep (AOC B).	Area is now a gravel and paved lot. Have photo.	Investigation to be Proposed and No Further Investigation	AOC A has 2 locations, the Former Coke Plant and the Benzol Process Area Former Coke Plant 1. SWMU Not Previously Investigated 4. Inactive and removed 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Secondary Containment may not be Reliable – asphalt pavement with no curbs and high-level alarm 9. No relevant Data 11. Safe Investigation is Possible at this Time Investigation to be Proposed Benzol Process Area 1. Previously Investigated 2. Evidence of a Release 3. Release Delineated and duel phase extraction system installed as an interim measure during the fourth quarter 2005 and currently operating No Further Investigation
AOC E	AOC E Underground Fuel Storage Tanks	The original tanks were installed in 1979 and replaced in 1989 with two underground, 8,000-gallon, double-walled, fiberglass fuel storage tanks. One of the tanks contained diesel fuel and the other gasoline. Closed Under UST Program	1999 - At the time of removal, tanks were inspected and confirmed to be structurally sound. At a later date, sampling was conducted at the high water table. The results indicated greater than 100 ppm TPH. The facility intends to investigate further.	New tanks were installed (double-walled with secondary containment system and leak detection) and are in use. Have photo.	Investigation to be proposed	1. SWMU Not Previously Investigated Investigation to be Proposed based on CCR (1999)

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Belle SWMUs Summary Information
DuPont Belle Plant, Belle West Virginia

SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
AOC F	AOC F Formaldehyde Spill	On August 8, 1983, approximately 4,000-lb. of a 56% formaldehyde solution was discharged to Simmons Creek. The spill was caused by the failure of a process pump.	1999 - On August 8, 1983, approximately 4,000 lb. of a 56% formaldehyde solution was discharged to Simmons Creek. The spill was caused by the failure of a process pump.	Storm sewer discharge point located.	Decision Tree not Applicable - Investigation to be Proposed	This is an isolated spill of 56% formaldehyde solution. Spill caused as overflow in the pump containment system and the spill material entered a storm sewer which discharged to Simmons Creek. Formaldehyde rapidly dissipates in air and soil so none of the material was recovered. There were no observed effects on aquatic life due to the spill. Investigation to be Proposed - Sediments near the discharge point of the storm sewer into Simmons Creek will be sampled for evidence of the spill.
AOC G	AOC G Sulfuric Acid Spill	On November 9, 1988, approximately 3,000-lb. of sulfuric acid was discharged to the Kanawha River. The spill was caused by a leak in a heat exchanger in the Spent Acid Regeneration Plant.	1999 - On November 9, 1988, approximately 3,000 lb. of sulfuric acid was discharged to the Kanawha River. The spill was caused by a leak in a heat exchanger in the Spent Acid Regeneration Plant.	Unit is being dismantled. Have photo.	Decision Tree not Applicable - Investigation to be Proposed	This is an isolated spill of sulfuric acid which occurred on an asphalt area in the Spent Acid Regeneration Plant which then flowed to the Kanawha River. Investigation to be Proposed – Soils will be investigated at the edge of the asphalt pad.
24	OSD Indoor Trench and Sump System	The unit consists of concrete floor trenches, a grinder sump, and a pump sump. The unit was used as a collection system for bottom ash from the OSD Coal/Waste-Fired Boilers (SWMUs 15-1 9). The bottom ash was washed out of the boilers and discharged to the floor trenches. These trenches are 1.5 ft. wide and 0.5 to 1 ft. deep. The slurry from the trench discharged to the concrete grinder sump which is 8 ft. square and 14- ft. deep. The steel grinder crushed the bottom ash so it can be pumped and flow to the pump sump. The pump sump is 10 ft. long, 5 ft. wide and 10 ft. deep.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Fly ash only	Unit still exists, and is in use. Have photo.	Investigation Deferred	1. SWMU Not Previously Investigated 4. Active 6. Below Ground 11. Safe Investigation Not Possible at this Time Investigation Deferred until Unit is inactive
31	OSD Trench and Sump System	This unit is comprised on a series of ground level concrete trenches and a sump. The trenches are 6-12 inches wide, vary in depth from 6-12 inches, and are covered by steel grates and plates. All the trenches flow to a sump with dimensions 15 ft. by 8 ft. and 15 ft. deep. The sump discharges to the WWTP.	1999 - No releases at this SWMU are known or suspected. However, hazardous waste was contained in the sump as a result of overfilling SWMU 28.	Unit still exists. Active as secondary containment for SWMU 26 which is used for tote storage. Have photo.	Investigation Deferred	1. SWMU Not Previously Investigated 4. Active 6. Below Ground 11. Safe Investigation Not Possible at this Time Investigation Deferred until Unit is inactive
38	Vazo Trench and Sump System	This unit consists of a series of concrete lined trenches 6-1 2 inches wide, 6-1 2 inches deep, which are covered by steel grates and plates. Waste water collected in the trenches discharges to sumps which average 24 ft. by 3 ft. and 5 ft. deep in size.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit receives quarterly inspections.	Inside building. Unit is still active. Have photo of building.	Investigation Deferred	1. SWMU Not Previously Investigated 4. Active 6. Below Ground 11. Safe Investigation Not Possible at this Time Investigation Deferred until Unit is inactive

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Belle SWMUs Summary Information
DuPont Belle Plant, Belle West Virginia

SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
105	SLM Indoor Trench and Sump System	A series of trenches and sumps used to collect any spillage and wash-down waters. The trenches are 12-inches wide, 12-inches deep and are covered with steel grates and boiler plates. The sumps are about 2 ft. by 3 ft. and 3 ft. deep and are lined with acid brick.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit receives quarterly inspections.	Inside building and in use. Have photo.	Investigation Deferred	1. SWMU Not Previously Investigated 4. Active 6. Below Ground 11. Safe Investigation is not Possible at this Time Investigation Deferred until Unit is inactive
106	SLM Outdoor Trench and Sump System	This unit is a series of trenches and sumps used to collect any spillage and run-off from the SLM tanks and wash pad. The trenches vary in width and depth between 6-1 8-inches and are covered with steel grates and boiler plates.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit receives quarterly inspections.	In use. Have photo.	Investigation Deferred	1. SWMU Not Previously Investigated 4. Active 6. Below Ground 11. Safe Investigation is not Possible at this Time Investigation Deferred until Unit is inactive
145	WCS Facility Sewer Lines	These units (SWMUs 145 to 161) consist of the Facility Sewer lines, a series of pumping stations, collection flumes, and ancillary pumps. The purpose of these units is to collect both sanitary and process waste waters and convey the wastes to the WP. Currently, there have been no observations of restricted flow in the underground lines. The system is all gravity flow.	1999 - Small infrequent overflows have occurred from the pumping stations due to equipment failure. Lines are replaced on an as-needed basis as lines fail. Releases have occurred from these units.	SWMUs 145-161 are in various states of use, some exist, some no longer exist and some have been updated.	Investigation Deferred	1. SWMU Not Previously Investigated 4. Active 6. Below Ground 7. Known releases 9. No Relevant Data 11. Safe Investigation not Possible at this Time Investigation Deferred until Unit is inactive
146	WCS Pumping Station	See SWMU 145	1999 - See SWMU 145.	Have photo. See SWMU 145	Investigation Deferred	1. SWMU Not Previously Investigated 4. Active 6. Below Ground 7. Known releases 9. No Relevant Data 11. Safe Investigation not Possible at this Time Investigation Deferred until Unit is inactive
147	WCS Pumping Station (#2)	See SWMU 145	1999 - See SWMU 145.	Location on map corrected. In very congested location and in use. Have photo. See SWMU 145	Investigation Deferred	1. SWMU Not Previously Investigated 4. Active 6. Below Ground 7. Known releases 9. No Relevant Data 11. Safe Investigation not Possible at this Time Investigation Deferred until Unit is inactive
148	WCS Pumping Station (#4)	See SWMU 145	1999 - See SWMU 145.	Not in use. Have photo. See SWMU 145	Investigation Deferred	1. SWMU Not Previously Investigated 4. Active 6. Below Ground 7. Known releases 9. No Relevant Data 11. Safe Investigation not Possible at this Time Investigation Deferred until Unit is inactive

Table 1
Belle SWMUs Summary Information
DuPont Belle Plant, Belle West Virginia

SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
149	WCS Pumping Station	See SWMU 145	1999 - See SWMU 145.	Have photo. See SWMU 145	Investigation Deferred	1. SWMU Not Previously Investigated 4. Active 6. Below Ground 7. Known releases 9. No Relevant Data 11. Safe Investigation not Possible at this Time Investigation Deferred until Unit is inactive
152	WCS Pumping Station	See SWMU 145	1999 - See SWMU 145.	Have photo. See SWMU 145	Investigation Deferred	1. SWMU Not Previously Investigated 4. Active 6. Below Ground 7. Known releases 9. No Relevant Data 11. Safe Investigation not Possible at this Time Investigation Deferred until Unit is inactive
154	WCS Pumping Station	See SWMU 145	1999 - See SWMU 145.	In use, but deteriorated. Have photo. See SWMU 145	Investigation Deferred	1. SWMU Not Previously Investigated 4. Active 6. Below Ground 7. Known releases 9. No Relevant Data 11. Safe Investigation not Possible at this Time Investigation Deferred until Unit is inactive
157	WCS Pumping Station	See SWMU 145	1999 - See SWMU 145.	Have photo. See SWMU 145	Investigation Deferred	1. SWMU Not Previously Investigated 4. Active 6. Below Ground 7. Known releases 9. No Relevant Data 11. Safe Investigation not Possible at this Time Investigation Deferred until Unit is inactive
158	WCS Pumping Station	See SWMU 145	1999 - See SWMU 145.	Not in use, is covered by concrete and pavement. Have photo. See SWMU 145	Investigation Deferred	1. SWMU Not Previously Investigated 4. Active 6. Below Ground 7. Known releases 9. No Relevant Data 11. Safe Investigation not Possible at this Time Investigation Deferred until Unit is inactive

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Belle SWMUs Summary Information
DuPont Belle Plant, Belle West Virginia

SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
1	SSS Wastewater Tank No. 1	The unit is a 16,000- gallon steel vertical, cylindrical above ground covered tank that is used as an intermediate hold-up and treatment tank for the neutralization of an acidic waste stream from the SSS Area. The tank is 10 feet in diameter and 32.75 ft. high. The tank rests on a 1.83 ft. thick concrete pad. There is a one foot high concrete containment dike that surrounds the base of the tank which will hold 1,100 gallons.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during Visual Site Inspection (VSI) or Preliminary Review (PR). Unit has good secondary containment.	Tank was removed. Area is now a gravel lot next to the SSS DPE system. Have photo. In SSS area, lots of previous investigations and sampling resulting in installation and operation of current DPE system and additional sampling conducted under the Phase II ESA prior to leasing to Kureha. Investigated with SWMUS 5, 6, 7, 9, 10 and 11.	No Further Action	1. SWMU Previously Investigated - during the Phase II RFI [(see Phase II RFI Investigation report (DuPont CRG, 2003)] 2. No Evidence of Release - Evidence of a release in the area not specifically associated with the SWMU, but likely associated with the former adipic acid process that resided in the location prior to the SSS process or to the SSS process. Duel-phase extraction implemented as an Interim Remedial measure in March of 2005 and continues to operate. No Further Action
2	SSS Wastewater Tank No. 4	These two units (SWMUs 2 and 3) were identical carbon steel, closed-topped tanks (35 ft.in diameter and 35 ft. tall with a capacity of 250,000-gallons) which rested on concrete pads within a concrete walled containment dike and managed neutralized waste waters from the manufacture of SSS. These units were removed in 1997.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Tanks had good secondary containment.	Tank was removed. Area is now the Kureha parking lot. Have photo. Under active paved parking lot (SWMUs 2,3,12, and 13). After tanks were removed the area was backfilled to make it level and then it was turned into the C&D landfill which was active until 2010. Area was then paved and used as a parking lot. Phase I soil sampling was conducted and showed only 1 PAH and 1 kepone exceedance.	No Further Action	1. SWMU Previously Investigated - during the Phase I RFI [see Phase I RFI Work Plan (DuPont CRG, 2000) and the RFI Summary of Analytical Results (DuPont CRG, 2002)] 2. No Evidence of a Release - 3 soils samples and 1 nearby groundwater sample No Further Action
3	SSS Wastewater Tank No. 5	See SWMU 2	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Tanks had good secondary containment.	Tank was removed. Area is now the Kureha parking lot. Have photo. See SWMU 2.	No Further Action	1. SWMU Previously Investigated - during the Belle Manufacturing Area Phase II Investigation (DuPont CRG, 2008) 2. No Evidence of a Release No Further Action

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Belle SWMUs Summary Information
DuPont Belle Plant, Belle West Virginia

SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
4	SSS D-2 Tank	The unit is a vertical, above-grade, epoxy-lined, carbon steel tank with a capacity of 55,000-gallons. The tank rests within a concrete containment system. The tank is used to separate DMA from an aqueous phase.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit has good secondary containment.	Tank was removed. Kureha trailers now parked in this area. Have photo. Investigated with SWMUs 8, 11, 14, 156 and 184.	No Further Action	1. SWMU Previously Investigated - during the Belle Manufacturing Area Phase II Investigation (DuPont CRG, 2008) 2. No Evidence of a Release No Further Action
5	SSS BEB Heel Pot Tank	The unit is a 6 ft. high, carbon steel tank with a diameter of 5 ft. which is elevated 4 ft. above ground on steel legs. The tank received wastes containing BEB. The stand rests on a sloped concrete pad with a 2-inch curb on three sides.	1999 - The concrete pad beneath the unit was noted to be pitted during the VSI. There is no information in the file that indicates a release occurred.	Tank was removed. Area is now a gravel lot next to the SSS DPE system. Have photo. Investigated with SWMUS 1, 6, 7, 9, 10 and 11.	No Further Action	1. SWMU Previously Investigated - during the Phase II RFI [(see Phase II RFI Investigation report (DuPont CRG, 2003)] 2. No Evidence of Release - Evidence of a release in the area not specifically associated with the SWMU, but likely associated with the former adipic acid process that resided in the location prior to the SSS process or to the SSS process. Duel-phase extraction implemented as an Interim Remedial measure in March of 2005 and continues to operate. No Further Action
6	SSS Receiver Tank	The unit is a 10 ft. long, 8 ft. diameter horizontal tank resting on steel legs. The unit served as a hold-up tank for the methylene chloride still (SWMU 7). Currently, this unit is an active Ag-Products Tank.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Tank is located within a building with trench and sump collection system.	Tank was removed. Area is now a gravel lot next to the SSS DPE system. Have photo. Investigated with SWMUS 1, 5, 7, 9, 10 and 11.	No Further Action	1. SWMU Previously Investigated - during the Phase II RFI [(see Phase II RFI Investigation report (DuPont CRG, 2003)] 2. No Evidence of Release - Evidence of a release in the area not specifically associated with the SWMU, but likely associated with the former adipic acid process that resided in the location prior to the SSS process or to the SSS process. Duel-phase extraction implemented as an Interim Remedial measure in March of 2005 and continues to operate. No Further Action
7	SSS Methylene Chloride Still	The unit is a steel tank supported by steel legs with a capacity of approximately 600-gallons. This unit received liquid waste containing methanol and toluene.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Tank is located within a building.	Tank was removed. Area is now a gravel lot next to the SSS DPE system. Have photo. Investigated with SWMUS 1, 5, 6, 9, 10 and 11.	No Further Action	1. SWMU Previously Investigated - during the Phase II RFI [(see Phase II RFI Investigation report (DuPont CRG, 2003)] 2. No Evidence of Release - Evidence of a release in the area not specifically associated with the SWMU, but likely associated with the former adipic acid process that resided in the location prior to the SSS process or to the SSS process. Duel-phase extraction implemented as an Interim Remedial measure in March of 2005 and continues to operate. No Further Action
8	SSS Unidentified Contents Drum Storage Areas	This unit consisted of thirty-one 55-gallon drums with unknown contents (assumed to be contaminated soil and wastewater). Drums were managed in accordance with RCRA regulations after the contents were analyzed. The drums were removed and disposed of properly.	1999 - During VSI, drums were located on pallets on soil. Surface. Drums were noted to be rusted and corroded. Drums were removed and disposed of properly.	Storage area is now located under a building. Dirt was excavated. Data generated by Potesta. Have photo. Investigated with SWMUs 4, 11, 14, 156 and 184.	No Further Action	1. SWMU Previously Investigated - during the Belle Manufacturing Area Phase II Investigation (DuPont CRG, 2008) 2. No Evidence of a Release No Further Action

Table 1
Belle SWMUs Summary Information
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SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
9	SSS Trench and Sump System	The unit consists of (acid resistant) brick lined trenches and sumps which receive waste water from the SSS Area. The trenches vary in depth from 6 -12 inches and in width from 6 - 24 inches. The sumps vary in depth from 2 to 10 ft. and in diameter from 3 to 6 ft.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit is acid brick lined with portions of the system located within a building. Unit receives quarterly inspections.	SSS Trench and Sump System were removed. DPE area. Data by Potesta. Have photo. Investigated with SWMUS 1, 5, 6, 7, 10 and 11.	No Further Action	1. SWMU Previously Investigated - during the Phase II RFI [(see Phase II RFI Investigation report (DuPont CRG, 2003)] 2. No Evidence of Release - Evidence of a release in the area not specifically associated with the SWMU, but likely associated with the former adipic acid process that resided in the location prior to the SSS process or to the SSS process. Duel-phase extraction implemented as an Interim Remedial measure in March of 2005 and continues to operate. No Further Action
10	SSS Loading/Unloading Areas	This unit consists of two pads which are approximately 60 ft. long, 12 ft. wide, and have 4-inch high curbs which run the length of each pad. The pads were used to load product, spent oleum, and methylene chloride, and to unload oleum, methylene chloride, and hydrochloric acid. Currently, this unit is used by Ag-Products.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit has good secondary containment. Minor cracks were noted during visual inspection.	Next to the SSS DPE system. Have photo. Investigated with SWMUS 1, 5, 6, 7, 9 and 11.	No Further Action	1. SWMU Previously Investigated - during the Phase II RFI [(see Phase II RFI Investigation report (DuPont CRG, 2003)] 2. No Evidence of Release - Evidence of a release in the area not specifically associated with the SWMU, but likely associated with the former adipic acid process that resided in the location prior to the SSS process or to the SSS process. Duel-phase extraction implemented as an Interim Remedial measure in March of 2005 and continues to operate. No Further Action
11	Former SSS Container Storage Area C	This is a closed RCRA-regulated unit. The unit had a capacity of 11,000-gallons (200 55-gallon containers). The unit was 30 ft. wide, 50 ft. long and had an asphalt base. The area is now used to store wooden pallets.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Rinsate samples collected from the pad during closure indicated that no contaminants remained on the pad.	Pad is gone. Kureha operations are where the pad was located. Have photo. Investigated with SWMUs 4, 8, 14, 156 and 184. And with Investigated with SWMUS 1, 5, 6, 7, 9, and 10.	No Further Action	1. SWMU Previously Investigated - during the Belle Manufacturing Area Phase II Investigation (DuPont CRG, 2008) 2. No Evidence of a Release No Further Action
12	Former SSS Wastewater Tank No. 3 (Tank ID No. 73)	The tanks (SWMUs 12 and 13) have been removed from this area. The tanks were each 250,000-gallon vertical, cylindrical above ground covered tanks which were used for storage of a neutralized acid waste stream. The tanks were 35 ft. high with diameters of 35 - ft. and were constructed of steel. The tanks rested on a 2 ft. thick compacted earth and gravel fill foundation. A sump was located within the 6 ft. high diked containment area.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Secondary containment consisted of a compacted earth and gravel fill foundation within a 6 ft. high diked containment area.	Gone. Kureha parking lot near Rt. 60. Have photo. Investigated with SWMUS 2, 3, and 13. See SWMU 2.	No Further Action	1. SWMU Previously Investigated - during the Phase I RFI [see Phase I RFI Work Plan (DuPont CRG, 2000) and the RFI Summary of Analytical Results (DuPont CRG, 2002)] 2. No Evidence of a Release - 3 soils samples and 1 nearby groundwater sample No Further Action

Table 1
Belle SWMUs Summary Information
DuPont Belle Plant, Belle West Virginia

SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
13	Former SSS Wastewater Tank No. 6 (Tank ID No. 74)	See SWMU 12 Current Conditions Report SWMU Description (1999)	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Secondary containment consisted of a compacted earth and gravel fill foundation within a 6 ft. high diked containment area.	Tank was removed. Location is under Kureha parking lot near Rt. 60. Fill dirt was added to bring up to grade. Made into C&D landfill. C&D landfill active until 2010. Have photo. Investigated with SWMUs 2, 3, and 12. See SWMU 2.	No Further Action	1. SWMU Previously Investigated - during the Phase I RFI [see Phase I RFI Work Plan (DuPont CRG, 2000) and the RFI Summary of Analytical Results (DuPont CRG, 2002)] 2. No Evidence of a Release - 3 soils samples and 1 nearby groundwater sample No Further Action
14	Former SSS Calgon Treatment System	The system treated brine generated from the manufacture of an organic intermediate for the textile fibers industry. The unit consists of two steel carbon absorption vessels. The tanks were mounted above a concrete floor inside of Building 226. This unit was relocated in March 1985 and reinstalled in the rear of the building.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit was located within a building with trench and sump collection system.	Treatment system was removed. May have Potesta soil sample data. Now Kureha trailer city north of SSS DPE is now located in this area. Have photo. Investigated with SWMUs 4, 8, 11, 156 and 184.	No Further Action	1. SWMU Previously Investigated - during the Belle Manufacturing Area Phase II Investigation (DuPont CRG, 2008) 2. No Evidence of a Release No Further Action
15	OSD Coal/Waste Fired Boiler #6	The system treated brine generated from the manufacture of an organic intermediate for the textile fibers industry. The unit consists of two steel carbon absorption vessels. The tanks were mounted above a concrete floor inside of Building 226. This unit was relocated in March 1985 and reinstalled in the rear of the building.	1999 - No releases at these SWMUs are known or suspected. No evidence of a release observed during VSI or PR. Units are vented through mechanical collectors which lead to three electrostatic precipitators.	Closure documents were located (4/98). Plant boilers 6, 10, 14, and 15 are still in use as gas fired boilers. No photos.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (now gas fired) 5. Closure Documentation Available No Further Action
16	OSD Coal/Waste Fired Boiler #9	The system treated brine generated from the manufacture of an organic intermediate for the textile fibers industry. The unit consists of two steel carbon absorption vessels. The tanks were mounted above a concrete floor inside of Building 226. This unit was relocated in March 1985 and reinstalled in the rear of the building.	1999 - No releases at these SWMUs are known or suspected. No evidence of a release observed during VSI or PR. Units are vented through mechanical collectors which lead to three electrostatic precipitators.	Boiler still in place inside building, but not used. Files (DEP) located (12/97, 12/99) that declare unit no longer burns coal. Closure documentation located.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (now gas fired) 5. Closure Documentation Available No Further Action
17	OSD Coal/Waste Fired Boiler #10	The system treated brine generated from the manufacture of an organic intermediate for the textile fibers industry. The unit consists of two steel carbon absorption vessels. The tanks were mounted above a concrete floor inside of Building 226. This unit was relocated in March 1985 and reinstalled in the rear of the building.	1999 - No releases at these SWMUs are known or suspected. No evidence of a release observed during VSI or PR. Units are vented through mechanical collectors which lead to three electrostatic precipitators.	Inside building and in use, but not coal fired.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (now gas fired) 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action

Table 1
Belle SWMUs Summary Information
DuPont Belle Plant, Belle West Virginia

SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
18	OSD Coal/Waste Fired Boiler #14	The system treated brine generated from the manufacture of an organic intermediate for the textile fibers industry. The unit consists of two steel carbon absorption vessels. The tanks were mounted above a concrete floor inside of Building 226. This unit was relocated in March 1985 and reinstalled in the rear of the building.	1999 - No releases at these SWMUs are known or suspected. No evidence of a release observed during VSI or PR. Units are vented through mechanical collectors which lead to three electrostatic precipitators.	Inside building. Files (DEP) located (12/97, 12/99) that declare unit no longer burns coal. Closure documentation located.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (now gas fired) 5. Closure Documentation Available No Further Action
19	OSD Coal/Waste Fired Boiler #15	The system treated brine generated from the manufacture of an organic intermediate for the textile fibers industry. The unit consists of two steel carbon absorption vessels. The tanks were mounted above a concrete floor inside of Building 226. This unit was relocated in March 1985 and reinstalled in the rear of the building.	1999 - No releases at these SWMUs are known or suspected. No evidence of a release observed during VSI or PR. Units are vented through mechanical collectors which lead to three electrostatic precipitators.	Inside building and in use, but not coal fired.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (now gas fired) 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
20	OSD Electrostatic Precipitator No. 2	There are three electrostatic precipitators (EPs) (SWMUs 20-22) which were manufactured by Universal Oil Product. The No. 2 EP received the off-gas from OSD Coal/Waste-Fired Boilers (No. 6 and 9). Off-gas was received by the No. 3 EP from Boilers No. 14 and 15 and EP No. 5 receives off-gas from Boiler No. 10. The boilers were required to operate at 90% efficiency. Both fly ash and bottom ash were generated in the burning process. Fly ash was collected in four hoppers. These units were put out of service in 1993. Closure reports are on file at the Site.	1999 - Units operated at 90% efficiency, indicating that 10% of the off-gases were released. SWMUs 21 and 22 are known to have discharged in excess of limitations. Closure reports exist for these units. Fly ash only	Unit still exists, but is no longer used. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (no longer used) 5. No Closure Documentation Available 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - inside building No Further Action
21	OSD Electrostatic Precipitator No. 5	See SWMU 20	1999 - See SWMU 20	Inside building and unit still exists, but is no longer used. George Harris may have the file.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (no longer used) 5. No Closure Documentation Available 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - inside building No Further Action
22	OSD Electrostatic Precipitator No. 3	See SWMU 20	1999 - See SWMU 20	Inside building and unit still exists, but is no longer used. George Harris may have the file.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (no longer used) 5. No Closure Documentation Available 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - inside building No Further Action

Table 1
Belle SWMUs Summary Information
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SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
23	OSD Fly Ash Silo and Baghouse	This unit is a silo that received fly ash from the OSD EPs (SWMUs 20-22) via air forced ducts. The silo is approximately 80 ft. in height, 25 ft. in diameter and is located on an asphalt paved area. The unit is constructed of tile-lined brick and has a capacity of 250 tons. The silo is equipped with a cyclone separator and bag filters. This unit is currently out of service.	1999 - No known releases greater than permitted discharge rate occurred at this unit. Unit has good secondary release controls. Fly ash only	Unit still exists, but is no longer used. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (no longer used) 5. No Closure Documentation Available 6. Above Ground 7. No Releases greater than permitted discharge rate 8. Reliable Secondary Containment - inside building No Further Action
25	OSD Bottom Ash Collection Tank	The unit was a 2,670 cu. ft. capacity steel tank. The unit was mounted above an asphalt roadway on steel legs. The tank had a conical bottom. The tank was used as a decantation tank for the water/bottom ash slurry. The bottom ash settled out and the water was decanted off. About 90% of the water was recycled through the system. The remaining 10% was sent to the River Water Filter Plant for treatment.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PA Fly ash only.	Tank and concrete pad gone, covered in asphalt. Have photo. Photo from 1993-1994 shows floor trench for containment (SWMU 24).	No Further Action	1. SWMU Not Previously Investigated 4. Inactive and removed 5. No Closure Documentation Available 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - floor trenches (SWMU 24) No Further Action
26	OSD Unloading Area	The unit is a concrete pad with collection trenches. The pad is 150 ft. long, 50 ft. wide and curbed on three sides with a slope for curb collection. The trenches are 1 ft. wide and 6 inches deep. The wastes received in this area are hazardous and nonhazardous wastes generated onsite and offsite.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit has adequate secondary containment.	This is SWMU that is used, but not for its original purpose. Secondary containment goes to waste water treatment plant. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive, but used 5. No Closure Documentation Available 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - sloped concrete pad with three curbs and trenches No Further Action
27	OSD Pad Tank	The unit was an above ground, horizontal tank that was approximately 6 ft. long, 4 ft. in diameter with a capacity. The unit was an above ground, horizontal tank that was of 500-gallons. It was constructed of steel and rested on two steel cradles about 2 ft. above ground level. Material entered the tank via a funnel and valve system on the top of the tank. These wastes were then burned in the OSD Coal/Waste-Fired Boilers.	1999 - No releases at this SWMU are known or suspected. Minor staining on tank was noted during VSI, but no staining was observed on concrete pad	Tank was removed. Concrete pad still exists. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action

Table 1
Belle SWMUs Summary Information
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SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
28	OSD Hazardous Waste Tank No. 1 (ID No. 4A)	This RCRA -regulated unit was a vertical, steel, cylindrical, above ground covered tank used for waste storage prior to burning in the OSD Coal/Waste-Fired Boilers. The tank was 30 ft. high and had a maximum capacity of 158,000-gallons. The tank was located on a 2.75 ft. thick concrete pad and was surrounded by a 5.5 ft. dike providing 172,000 gallons of containment.	1999 - A log noted that leaks and corrective action had occurred in the OSD area. It is not known if this tank leaked. In 1988, this tank was overfilled and waste flowed into containment area. The unit had good secondary containment. Potential exposure from this unit was limited.	Tank was removed. Closure documentation was located. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive and removed 5. Closure Documentation Available No Further Action
29	OSD Hazardous Waste Tank No. 2 (ID No. 4B)	This RCW regulated unit is a vertical, steel, cylindrical, above ground covered tank used for waste storage prior to burning in the OSD Coal/Waste-Fired Boilers. The tank is 30 ft. high, with a 12 ft. outside diameter and a maximum capacity of 25,000-gallons. The tank is located on a concrete pad and is surrounded by a 5.5 ft. dike providing 43,100-gallons of containment.	1999 - A release has occurred at this unit. The unit had good secondary containment. Potential exposure from this unit was limited.	Tank was removed. Closure documentation was located. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive and removed 5. Closure Documentation Available No Further Action
30	OSD Hazardous Waste Tank No. 3 (ID No. 4C)	This RCW regulated unit is a vertical, steel, cylindrical, above ground covered tank used for waste storage prior to burning in the OSD Coal/Waste-Fired Boilers. The tank is 35 ft. high, with a 13 ft. outside diameter and a maximum capacity of 25,000-gallons. The tank is located on a concrete pad and is surrounded by a 5.5 ft. dike providing 43,100-gallons of containment.	1999 - A release has occurred at this unit. Unit has good secondary containment. Potential exposure from this unit was limited.	Tank and concrete pad were removed. Closure documentation was located. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive and removed 5. Closure Documentation Available No Further Action
36	Vazo AN Hazardous Waste Tank (ID No. 24)	This RCRA-regulated unit is a steel horizontal, cylindrical, above ground, indoor tank that stored rinsate from the amino nitrile filters. The tank is 9 ft. long, 5 ft. in diameter, and has a 1,140-gallon maximum capacity. The tank is supported by two steel cradles which rest on a 6-inch concrete foundation.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit was located within a building with trench and sump collection system. Unit was inspected daily.	Tank was removed. Area is mostly asphalt or 6 inches of gravel, but with lots of process piping around. Closure documentation was found. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive 5. Closure Documentation Located No Further Action
37	Vazo (new) Hazardous Waste Tank	This RCRA-regulated unit is a carbon steel vertical, above ground, outdoor tank that received wastes from the Vazo AN Hazardous Waste Tank (SWMU 24). The tank is 30 ft. high, 5 ft. in diameter, and has a 9,300 gallon maximum capacity. The tank is located within a concrete containment system that is 13 ft. by 26 ft. and 5 ft. high.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit has good secondary containment.	Unit is still active. This is a “new” stack. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Active 6. Above Ground 7. No Releases 8. Reliable Secondary Containment – concrete containment system with sump in corner No Further Action

Table 1
Belle SWMUs Summary Information
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SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
39	Vazo Seal Pot	The unit is a vertical, stainless steel tank that is 5 ft. high and 4 ft.in diameter. The tank receives wastewater collected in the Vazo floor trench and sump system. This unit discharges to the WWTP.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit receives quarterly inspections.	Inside building. Unit is still active. Have photo of building.	No Further Action	1. SWMU Not Previously Investigated 4. Active 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - inside building No Further Action
40	Vazo Container Storage Area M	This RCRA-regulated unit is a section of a warehouse dedicated to the storage of Vazo waste. The area is 25 ft. long and 5 ft. wide. The warehouse has a cement floor and wastes are stored in containers which rest on pallets. The area is capable of storing 11,000 gallons of waste when fiber containers are stacked.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit receives quarterly inspections.	Unit is still active. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Active 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - inside building No Further Action
42	Former Vazo Hazardous Waste Tank (ID No. 25)	These units (SWMUs 42 and 43) were identical vertical, cylindrical, above ground, covered tanks that were used to store amino nitrile washings from the Vazo AN hazardous waste tank. The tanks were about 22 ft. high, 8 ft. in diameter, and had a capacity of 8,800-gallons. Certification that these RCRA regulated units were closed was submitted to WVDNR on June 22, 1990.	1999 - No releases at these SWMUs are known or suspected. No evidence of a release observed during VSI or PR. Units have good secondary containment.	Tank was removed. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (removed) 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
43	Former Vazo Hazardous Waste Tank (ID No. 26)	See SWMU 42	1999 - No releases at these SWMUs are known or suspected. No evidence of a release observed during VSI or PR. Units have good secondary containment.	Tank was removed. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (removed) 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
44	Former Vazo Container Storage Area L	This unit was a partially-curbed 12 by 30 ft. asphalt pad. The majority of the unit was excavated in 1990. Certification that this RCRA regulated unit was closed was submitted to WVDNR on June 22, 1990.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Soil sampling conducted at time of closure indicated that No releases had occurred from this unit.	Paved with new stack on it (see SWMU 37). Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (removed) 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
45	Former Vazo Container Storage Area N	This unit was an enclosed, refrigerated trailer van. The maximum inventory of the unit was 2,600-lb. or fifty-two 50-lb. leverpak drums. The trailer was located on an asphalt pad. The facility submitted a certification for closure on December 12, 1986.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Activities at this unit were conducted in an enclosed, refrigerated trailer van located on an asphalt pad.	No longer used for RCRA wastes. Still use the trailers for product storage.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (used for different purpose) 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action

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Belle SWMUs Summary Information
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SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
46	Ag-Mature SBU Hazardous Waste Tank	The unit was a horizontal, cylindrical, above ground tank that stored vacuum still waste. The tank was 6 ft. in diameter, 18 ft. in length, and had a maximum capacity of 3,600-gallons. This RCRA regulated unit was closed in 1996.	1999 - A release did occur from this unit in 1989. The spill was contained within the trench system. There was No release to the environment due to this spill. Upgrade of containment system occurred in 1989.	Tank was removed. Closure documentation located. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (removed) 5. Closure Documentation Located. No Further Action
47	Ag-Mature SBU Mother Liquor Tank	The unit is a 5,150-gallon, vertical steel tank. The tank is 10 ft. tall and 10 ft. in diameter and is supported above a concrete containment system by a steel skirt. The tank is primarily used as a process tank in the production of SBU and as a hold-up tank for wash water.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit has good secondary containment. Unit receives quarterly inspections.	Tank was removed. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (removed) 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - concrete floors with dikes and sump No Further Action
49	Ag-Mature SBU Container Storage Area BB	This unit is a 50 ft. square asphalt pad. There are no curbs or dikes associated with this unit. The pad slopes to the south to a drain which is connected to the WWTP. The unit is used to store containers of wastes from several different process areas. This area was closed in 1991	1999 - No releases at this SWMU are known. An oily sheen was observed on standing water in the southwest portion of the unit during the VSI. Information on cleaning and closure of this unit is one file at the plant.	Used for storage now. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (used for different purpose) 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
50	Ag-Mature SBU Wet Benlate Loading/ Unloading Area	There are two loading/unloading areas located in the Ag- Mature Wet Benlate area of the facility. The first unit is used for loading a Tank Wagon (SWMU 185) with MEK still bottoms from the benomyl pot still. The unit is a sloped concrete pad 10 ft. wide by 30 ft. long. The pad slopes from grade level on the east side to 0.5 ft. below grade on the western end. There is a concrete drain sump at the western end which is connected to SWMU 145. The second area is used for loading Tank Wagons with ammonia heads from SWMU 59. The unit is a 10 by 304 concrete pad with 1 ft. high concrete curbs on three sides. The pad slopes to a concrete sump located in the middle of this unit which is connected to SWMU 145.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit has good secondary containment.	SWMU is gone and is an asphalt and concrete area. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (removed) 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - concrete pad with curbs and sump to WWTP No Further Action

Table 1
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SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
51	Ag-Mature SBU Wet Benlate Satellite Accumulation Area	There are two satellite accumulation areas associated with the Wet Benlate process. The outdoor unit (SWMU 51) consists of a single 55-gallon drum located on a steel grate which is on a 3 by 5 ft. concrete pad surrounded by a 3-inch curb. This unit manages a waste lubricating oil from the Benomyl process. The indoor unit (SWMU 52) also consists of a 55-gallon drum located on a concrete floor surrounded by a 3-inch curb. This unit manages waste Benomyl which is generated during line cleaning and pump maintenance.	1999 - Unit was a single 55-gal drum. No releases at these SWMUs are known or suspected. No evidence of a release observed during VSI or PR. Unit has good secondary containment.	SWMU no longer exists. Area is covered in gravel. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (removed) 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Reliable Secondary Containment – concrete pad with curbs No Further Action
52	Ag-Mature SBU Wet Benlate Satellite Accumulation Area	There are two satellite accumulation areas associated with the Wet Benlate process. The outdoor unit (SWMU 51) consists of a single 55-gallon drum located on a steel grate which is on a 3 by 5 ft. concrete pad surrounded by a 3-inch curb. This unit manages a waste lubricating oil from the Benomyl process. The indoor unit (SWMU 52) also consists of a 55-gallon drum located on a concrete floor surrounded by a 3-inch curb. This unit manages waste Benomyl which is generated during line cleaning and pump maintenance.	1999 - Inside a building. Unit was a single 55-gal drum. No releases at these SWMUs are known or suspected. No evidence of a release observed during VSI or PR. Unit has good secondary containment.	SWMU no longer exists. Area is covered in gravel. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (removed) 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Reliable Secondary Containment – concrete floor with curbs and inside building with trench to WWTP No Further Action
55	Ag-Mature SBU Brine Treatment System-Waste Neutralization Tank	See SWMU 54	1999 - No releases at these SWMUs are known or suspected. No evidence of a release observed during VSI or PR.		No Further Action	1. SWMU Not Previously Investigated 4. Inactive and removed 6. Above Ground 7. No Releases 8. Reliable secondary Containment - inside building with trenches No Further Action
56	Ag-Mature SBU Brine Treatment System-Former Carbon Adsorption Unit	See SWMU 54	1999 - No releases at these SWMUs are known or suspected. No evidence of a release observed during VSI or PR.	Unit was removed and now is a gravel lot. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (Removed) 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - inside building with concrete floor and trenches to WWTP No Further Action

Table 1
Belle SWMUs Summary Information
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SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
57	Ag-Mature SBU Brine Treatment System-Former Transfer Vessel	See SWMU 54	1999 - No releases at these SWMUs are known or suspected. No evidence of a release observed during VSI or PR.	Vessel removed and now is a gravel lot. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (removed) 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - inside building with concrete floor and trenches to WWTP No Further Action
59	Ag-Mature SBU Brine Treatment System-Ag-Mature Benlate Hazardous Waste Tank	See SWMU 54	1999 - No releases at these SWMUs are known or suspected. No evidence of a release observed during VSI or PR.	Tank was removed and now is a gravel lot. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (removed) 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
60	Ag-Mature SBU Brine Treatment System-Current Benlate Raw Waste Brine Storage Tank	See SWMU 54	1999 - No releases at these SWMUs are known or suspected. No evidence of a release observed during VSI or PR.	In use by F3455 (Hex). Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive, but in use 6. Above Ground 7. No releases 8. Reliable secondary containment – concrete pad with curbs. No Further Action
61	Ag-Mature SBU Brine Treatment System-Former Treated Brine Storage Tank	See SWMU 54	1999 - No releases at these SWMUs are known or suspected. No evidence of a release observed during VSI or PR.	Tank was dismantled. Area now used for trailers and tents. Have Photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (removed) 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
62	Ag-Mature SBU Brine Treatment System-Former Ammonia Tails Storage Tank	See SWMU 54	1999 - No releases at these SWMUs are known or suspected. No evidence of a release observed during VSI or PR.	Tank was removed and now is a gravel lot. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (removed) 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
63	Former Ag-Mature SBU Container Storage Area GG	This unit is a 120 by 20 ft. asphalt pad which was used to store drums of spent carbon generated during change-outs of the former carbon adsorption unit (SWMU 56). This RCRA regulated unit was certified closed in 1987.	1999 - No releases at this SWMU are known or suspected. Run-off from this unit flowed to a trench and sump collection system.	Area is now concrete pads and asphalt. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (removed) 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - trench and sump No Further Action

Table 1
Belle SWMUs Summary Information
DuPont Belle Plant, Belle West Virginia

SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
65	Former MDA Unloading/Loading Area	This unit is a sealed concrete pad with dimensions of 8 by 100 ft. The pad has a 3-inch high concrete berm along the east side. The pad is sloped to the west so that run-off is directed to SWMU 67. The unit was used for loading a tank wagon with waste MDA tar. The tank will be dismantled in 1999.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Closure information is on file at the plant.	Loading area is gone. Area is now asphalt and gravel with a shed. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (removed) 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - concrete berm, spills would flow to a trench and sump system No Further Action
66	Former MDA Tank Wagon Unloading Vent Scrubber	The unit is a 200-gallon carbon steel tank which is 3 ft. in diameter, 4 ft. tall and is supported above concrete on steel legs. The unit is used during loading/unloading of a tank wagon at the former MDA Unloading area (SWMU 65). A vent on the tank wagon would be hooked up to the unit. Vapors from the wagon would be removed by water in the scrubber. The unit was last used in 1988 prior to shut down of the MDA process. The tank will be dismantled in 1999.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Closure information is on file at the plant.	Scrubber was removed. Area is now asphalt and gravel with a shed. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (removed) 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - concrete berm and trench system No Further Action
68	Former MDA Brine Filtration Units	The two steps associated with the MDA waste brine are the primary filtration unit and the final filtration unit. The primary unit consists of two carbon steel tanks with a capacity of 490-gallons, and a third carbon steel tank with the capacity of 8,000-gallons. The tanks are mounted on steel legs above a concrete pad. The final filtration unit consists of two 49-gallon, carbon steel tanks mounted on steel legs above a concrete containment dike. Both units have not been used since 1984. The tank will be dismantled in 1999.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit had good secondary containment. Dismantlement information is on file.	Filtration units were removed. Area is now asphalt and gravel with a shed. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (removed) 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - concrete pad and containment dike No Further Action
69	Former MDA Methanol Storage Tank	This unit was a 1,100-gallon carbon steel tank which was 54-inches in diameter and tall. The tank was used to accumulate waste methanol which was stripped from the MDA process. The unit was taken out of service in April 12, 1986. The unit was removed in July 1986 and sold for scrap.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Soil samples collected during removal of the tank indicated that a release had not occurred from this unit.	Tank was removed. Area is now asphalt and gravel with a shed. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (removed) 5. No Closure Documentation 6. Above Ground 7. No Releases 8. No Secondary Containment 9. Relevant Data Available - sampling during tank removal showed no release No Further Action

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SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
71	Former MDA No. 6 Aniline Tank	This unit is a 18,000-gallon, flat bottom, vertical, carbon steel tank. The unit is 12 ft. in diameter and is 20.75 fl. tall. The tank is located within a concrete block containment dike with a concrete floor. The tank was used as a standby tank to accumulate waste brine from the MDA process. The tank is empty and out of service.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit had good secondary containment. Dismantlement information is on file.	Tank was dismantled, but a new process is on most of the area. A small gravel area by the railroad tracks is still accessible for sampling if needed. Have photos.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive, but new process in place 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - concrete block containment with a concrete floor No Further Action
77	Former MDA/PACM Hazardous Waste Tank	This unit is a 250-gallon, horizontal, carbon steel tank. The tank is mounted on steel cradles just above a gravel pad. The tank was used to absorb ammonia from the ammonia chiller waste. The unit was closed in 1989.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit had no secondary containment. Soil samples collected during closure indicated that no release had occurred from this unit.		No Further Action	1. SWMU Not Previously Investigated 4. Inactive 5. No Closure Documentation 6. Above Ground 7. No Releases 8. No Secondary Containment 9. Relevant Data are Available - soil samples collected during closure indicated that no release had occurred from this unit. No Further Action
78	Former MDA/PACM Container Storage Area Q	This unit was a 69 ft. long by 37 ft. wide asphalt pad capable of storing 550 55-gallon drums. There were no dikes or run-off controls associated with the unit. Most of the asphalt in the unit is still in place, but some was removed during RCRA closure. The unit was certified closed in September 1989.	1999 - Minor releases to soil were discovered during closure of the unit. A small amount of contaminated soil was removed from a 10 ft. area during RCRA closure. Confirmatory soil sampling indicated that all of the contaminated soil was removed.	All buildings are gone, pads are gone. Area is covered with gravel lots and asphalt pads. Now has a WWTP hold-up tank in this location. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive, but active WWTP tank is in the location 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
81	Former C&P East DMS Area Tank (ID No. 10)	The unit is a vertical, cylindrical, above ground covered tank that was used as a hold-up tank for high boiling impurities. The tank is 6 ft. high, 8 ft. in diameter, and holds 2,965-gallons. The tank is supported by four steel legs located on a reinforced concrete foundation. The tank was closed under an approved closure plan in early 1984. Currently, the tank is used for 90-day storage.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit had good secondary containment. Unit receives quarterly inspection. Soil samples collected during closure indicated that a release from this unit had not occurred.	Permitted tank, in use. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive, but used 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Reliable Secondary Containment – concrete containment system, tank has high-level alarms and spills would go to sump to WWTP No Further Action
82	C&P East DMF Waste Tank (ID No. 47)	This 10,000-gallon unit a horizontal, cylindrical, above ground, covered tank receives DMF shot or still heel waste. The tank is 17-ft. long and has a diameter of 10 ft. The tank is supported by two concrete saddles that rest on a concrete foundation. This RCRA regulated unit is still active.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit had good secondary containment.	Closure documentation was located for this SWMU.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive 5. Closure Documentation Available No Further Action

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Belle SWMUs Summary Information
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SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
83	C&P East Drum Plant Container Storage Area T	This unit is a 16.5 ft. by 16.5 ft. asphalt base and curbing used for drum storage of acetic acid waste oil and contaminated gravel. The unit slopes to the southwest to a sump. This unit was closed in 1991.	1999 - No releases at this SWMU are known or suspected, however, during the VSI, standing water had a slight oil sheen in the southwest corner.	Drums and pad gone. Trailers parked in this area now. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive and closed 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
84	Former C&P East Hazardous Waste Tank (ID No. 48)	These units (SWMUs 84 and 85) were formerly used to store hazardous waste, but were closed due to a change in the DMF process. Closure of these RCRA regulated units occurred in September 1989.	1999 - Soil sampling conducted at the units during closure detected DMF at two locations. The concentrations were determined to not cause a health risk by WVDNR and closure was approved.	In use. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive and closed 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
85	Former C&P East Hazardous Waste Tank (ID No. 49)	See SWMU 84	1999 - See SWMU 84.	In use. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive and closed 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
87	Methacrylate Oil Storage Tank (ID No. 76)	These units (SWMUs 87 and 88) are cylindrical, above ground, horizontal tanks each with a 17,500-gallon capacity. Each tank rests on four concrete cradles on concrete pads within a concrete containment system. The tanks were originally used to store fuel oil and later stored an alternate-liquid fuel. This RCRA -regulated unit was closed in January 1992.	1999 - A release of approximately 1 gallon of ALF material was contained in the containment system and pumped back into the tanks. Unit had good secondary containment.	Tank was removed in 2011. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive, closed and removed 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
88	Methacrylate Oil Storage Tank (ID No. 77)	See SWMU 87	1999 - See SWMU 87.	Tank was removed in 2011. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive, closed and removed 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
89	Former Methacrylate Hazardous Waste Tank (ID No. 51)	This unit is a RCRA regulated, vertical, cylindrical, above ground, covered tank with dimensions of 30-ft. high, 17-ft. in diameter, and has a capacity of 50,000 gallons. The tank is located on a concrete pad within a containment system comprised of concrete walls with a soil base. The tank was used to manage wastes from the methacrylates process. The tank was last used in 1988 and was certified closed in December 1990.	1999 - Soil samples were collected during closure and analyzed for methanol and methacrylates. No levels of contamination were detected.	May be in use as a storage vessel for methacrylates foreshots? Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive, closed, but may be used 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action

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Belle SWMUs Summary Information
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SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
90	Former Methacrylate Distillation Column (ID No. 52)	This unit is a RCRA-regulated, vertical, cylindrical, above ground, covered tank that is 49-ft. high, 2.5 ft. in diameter, and has a capacity of 2,000-gallons. This unit managed wastes from the methacrylates process. This unit was certified closed in December 1990.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit had good secondary containment. Soil samples collected during closure indicated that No releases occurred from this unit.	Not removed, but closed, not in use. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive, closed, but not removed 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
91	Former Methacrylate Condensate Still Tank (ID No. 68)	This unit is a RCRA-regulated, two-chambered, 9,000-gallon tank which received a D001 waste that that was later sent offsite for incineration. The unit was last used in 1983 and was certified closed in July 1987.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit had good secondary containment.	Not removed but not in use. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive, closed, but not removed 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
92	Methacrylate Container Storage Area EE	This unit is a 22 ft. by 50-ft. concrete and gravel area which is surrounded by a 5.5-inch high curb on three sides. Drums of methacrylate wastes were stored at this unit. This unit was closed in 1991.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR.	Area is gravel/fill. Very “trashy”, Used as a laydown area, currently not in use. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive, but in use 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
94	SAR Weak Acid Sump Tank	This unit consists of a flat bottom Derakane 411-45 fiberglass, reinforced, resin tank with a 1,500-gallon capacity. The tank is 8.5-ft. tall and 6 ft. in diameter. The unit is used to accumulate a weak acid solution from the bottom of the SAR scrubber and waste waters from area sumps.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit has good secondary containment. Unit receives quarterly inspections.	Tank is not in use, but is ready for dismantlement. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive 5. Closure Documentation Available No Further Action
95	Methacrylate Loading/Unloading Area	This unit includes the Higher Methacrylate (HMA) Unloading Area and the SAR Unloading Area (SWMUs 95 and 96). The unit is a 50 ft. by 10-ft. concrete pad with 3-inch concrete curbs. The unit slopes to the south to a drain.	1999 - No releases at these SWMUs are known or suspected. No evidence of a release observed during VSI or PR. Units have good secondary containment.	Pads have been removed and area is not in use. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive and removed 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
96	Methacrylate Loading/Unloading Area	See SWMU 95 Current Conditions Report SWMU Description (1999).	1999 - See SWMU 95.	Area is not gravel and concrete and is not in use. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive and removed 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
98	SLM Mother Liquor Disengaging Tank	This unit is a steel tank that is 10-ft. tall and 5-ft. in diameter and rests on steel legs about 3 ft. above the acid brick floor. The tank received filtrate from the process centrifuge until 1987. Currently, this unit is in service for another process area.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Run-off from this unit flowed to a trench and sump collection system.	In use inside building. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive, but in use 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - trench and sump system inside building No Further Action

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SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
99	SLM Mother Liquor Tank (ID No. 60)	This unit is a horizontal, cylindrical, above ground, covered tank that was used to collect herbicide waste that was spilled within the building or from production tank wash-outs. The tank is 10-ft. high, is 6 ft. in diameter, and has a capacity of 2,750-gallons. The tank is supported by concrete cradles on a concrete pad. Currently, this tank is in service for another process area.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit had good secondary containment.	Not in use. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive 5. Closure Documentation Available No Further Action
100	SLM Flammable Waste Tank (ID No. 63)	This unit is a horizontal, above ground, covered tank used to receive any organic wastes present in the SLM tank (SWMU 103), the receiver, or the flare header drains. The tank is 6 ft. in diameter, 9 ft. high, and has a maximum capacity of 2,150-gallons. The tank rests on two concrete cradles underlain by a concrete containment system.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit had good secondary containment.	Still in the permit. Not in use and being prepared for closure. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive - Being prepared for closure 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
101	SLM Extractor Tank	This unit is a vertical, steel tank that receives waste from the SLM Flammable Waste Tank (SWMU 98). The tank is located within a concrete containment system. The unit is currently used for 90-Day storage.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit had good secondary containment.	Still in use. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive, but in use 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
102	SLM J Tank (ID No. 75)	This unit is a horizontal, cylindrical, above ground, covered tank. The tank is 13.5-ft. high, 10-ft. in diameter, and has an 8,000-gallon capacity. The tank rests on two concrete cradles and is located on a concrete pad.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit had good secondary containment.	Still in use. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive, but in use 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
103	SLM SP Tank (ID No. 59)	The unit is a vertical, cylindrical, above ground, covered tank that is used to contain spill material from the SLM Building. The tank is 13-ft. high, 7 ft. in diameter, and has a 2,850-gallon capacity. The tank is supported by four steel legs which rest on a concrete pad.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit had good secondary containment.	Still in use. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive 5. Closure Documentation Available No Further Action
104	SLM Caustic Surge Tank (ID No. 61)	The unit is a vertical, cylindrical, above ground, covered tank that is used as a surge tank for the caustic scrubber associated with process equipment. The tank is 8 ft. high, 6 ft. in diameter, and has a 2,000-gallon capacity.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Run-off from this unit flowed to a trench and sump collection system.	Inside building, in use. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Active 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - trench and sump system inside building No Further Action

Table 1
Belle SWMUs Summary Information
DuPont Belle Plant, Belle West Virginia

SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
107	SLM Drum Wash Pad	This unit is a 10-ft. by 200-ft. concrete pad with a 6-inch concrete curb. Fiberboard drums are brought to this area for rinsing prior to disposal.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit has good secondary containment.	In use. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Active 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Reliable Secondary Containment – concrete pad and curbs that drains to WWTP No Further Action
108	SLM Unloading/Loading Area	This unit is a 10-ft. by 80 ft. concrete pad with a trench in the center to collect run-off. The pad is used for loading tankers with wastes from the SLM J Tank (SWMU 102).	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR.	In use. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Active 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Reliable Secondary Containment – concrete pad with trench No Further Action
110	Former SLM Container Storage Area X	This unit is a 20 ft. square acid brick base storage area. Drummed hazardous waste generated in the SLM area was brought to this unit prior to off-site disposal. The RCRA-regulated unit has been closed per an approved closure plan in 1990.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Rinsate from cleaning the unit was analyzed during closure and no analytes were detected.	Not observed during 2012	No Further Action	1. SWMU Not Previously Investigated 4. Inactive and closed 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
111	Former SLM Container Storage Area Y	This unit was a 2- ft. by 40-ft., asphalt base container storage area. The area has been excavated and a concrete base placed for the Phosgene plant which now occupies this area. This RCRA-regulated unit was closed per an approved closure plan in July 1987.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Rinsate from cleaning the unit was analyzed during closure indicated that no detectable levels of organic analytes remained on the pad.	Phosgene unit torn down in 2011, but the concrete base for phosgene plant still exists. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive and closed 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
112	C&P West Glycol Hazardous Storage Tank No. 10 (ID No. 55)	These units (SWMUs 112 and 113) were two identical, vertical, cylindrical, above ground, covered tanks that were used to store ignitable waste from the glycol process. Each tank is about 27 ft. high, 12-ft. in diameter, and has a capacity of 19,400-gallons. These RCRA-regulated tanks were closed in 1991.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Units had good secondary containment.	Tank was removed and area is now a gravel lot. No photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive and closed 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
113	C&P West Glycol Hazardous Storage Tank No. 18 (ID No. 56)	See SWMU 112	1999 - See SWMU 112.	Tank was removed and area is now a gravel lot. No photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive and closed 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action

Table 1
Belle SWMUs Summary Information
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SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
114	C&P West Loading Pad	This unit is a 15-ft. by 30 ft. asphalt pad that has a 2-inch asphalt berm. Tankwagons (SWMU 185) are loaded with ethylene glycol overhead and bottoms from the C&P West Hazardous Waste Storage Tanks (SWMUs 112 and 113).	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Units had good secondary containment.	Asphalt pad was removed and is now a gravel-covered cement pad. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive and removed 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Reliable Secondary Containment – asphalt pad and berms and would flow to trench and sump No Further Action
116	Former C&P West Stripper Overhead Tank (ID No. 54A)	This unit is a horizontal, cylindrical, above ground, covered tank that was used as a surge tank prior to the waste entering the WWTP. The tank is 36-ft. long, 9-ft. in diameter and has a 17,750-gallon capacity. The tank rests on steel supports about 20 ft. above ground level. The RCRA-regulated unit is no longer operational and was closed under an approved closure plan in October 1990.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. No sampling was conducted during closure.	Tank was removed and area is now a gravel lot. No photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive and closed 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
117	Former C&P West Container Storage Area V	This unit is a 30 ft. by 60-ft. asphalt pad with asphalt curbing on two sides. Drums of wastes generated from various operations were stored at this unit. This RCRA regulated unit was closed under an approved closure plan in the summer of 1990.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR.	Area is now a gravel lot with several old foundations. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive and closed 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
118	Former C&P West Hazardous Waste Tank (ID No. 54B)	These units (SWMUs 118 and 119) are two 18,000 gallon tanks which were used to concentrate hydroxyacetic acid. The tanks are now used in the HAA process. Certification of closure for these RCRA regulated units was submitted in October 1987.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR.	Tank was removed. No photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive and closed 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
119	Former C&P West Hazardous Waste Tank (ID No. 54C)	See SWMU 118.	1999 - See SWMU 118.	Tank was removed. No photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive and closed 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
120	HCO Oil/Water Separator	This unit was a square steel tank that is 3 ft. by 3 ft. and 4-ft. tall which rested on a concrete floor. The unit received oily wastewater from the two sub-floor HCO Waste Lubricating Oil Collection Sumps (SWMU 122).	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit had good secondary containment.	Tank was removed and area is now a gravel lot. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive and removed 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Reliable Secondary Containment – inside building with concrete floor and berm No Further Action

Table 1
Belle SWMUs Summary Information
DuPont Belle Plant, Belle West Virginia

SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
123	Former HCO Hazardous Copper Waste Storage Tank (ID No. 6)	This unit was a 24,500-gallon tank which rested on a concrete pad within a diked area. The tank was used to store a corrosive process waste called copper liquor. The tank and containment system have been removed and the area was covered with gravel. The unit was closed under an approved closure plan in 1984.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit has good secondary containment.	SWMU no longer exists and area is covered by gravel. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive and closed 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
124	Former HCO Hazardous Carbon Waste Storage Tank (ID No. 6)	This unit consisted of two 1,500-gallon tanks which rested on a concrete pad. These tanks managed spent Building-activated carbon catalyst. The tanks and containment system have been removed and is now covered with gravel. The tanks were closed under an approved closure plan in 1984.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit has good secondary containment.	SWMU no longer exists and area is covered by gravel. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive, closed and removed 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
125	Former HCO Hazardous Methanol Waste Storage Tank (ID No. 8)	This unit was a 550-gallon steel tank which was used to store waste methanol from the production of hydrogen and carbon monoxide. The tank and containment system have been removed and the area is now gravel- covered. The unit was closed under an approved closure plan in 1984.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit has good secondary containment.	SWMU no longer exists and area is covered by gravel. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive, closed and removed 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
126	Former HCO Hazardous Container Storage Area I	This unit was a 40 ft. by 15-ft. asphalt pad with soil berms. The unit stored 14,300-gallons of containerized wastes. The unit was closed under an approved closure plan in 1990.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit has good secondary containment.	SWMU no longer exists and area is covered by gravel. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive, closed and removed 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
127	WWTP-Main Pumping Station	These units (SWMUs 127 to 144) treat both process and sanitary liquid waste generated at the plant. Units 128-144 are located on concrete foundations which not only provide structural support, but in some areas also provide some containment. Units were designed to prevent leakage. During replacement activities, concrete was deemed to be in good condition at these units.	1999 - No releases at these SWMUs are known or suspected. Prior to 1974, the area was covered with gravel. After 1974, the area was paved with asphalt. Several other layers have been added since then. During the VSI, the top layer of asphalt was noted to be deteriorated in several areas. Units have good secondary containment.	SWMU is an active part of the Belle WWTP. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Active 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - some secondary containment, but designed to prevent leakage, and several layers of asphalt with trench and sump system. No Further Action
128	WWTP-Isolation Tank No. 1	See SWMU 127	1999 - See SWMU 127.	Have photo. See SWMU 127	No Further Action	1. SWMU Not Previously Investigated 4. Active 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - some secondary containment, but designed to prevent leakage, and several layers of asphalt with trench and sump system. No Further Action

Table 1
Belle SWMUs Summary Information
DuPont Belle Plant, Belle West Virginia

SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
129	WWTP-Isolation Tank No. 2	See SWMU 127	1999 - See SWMU 127.	Have photo. See SWMU 127	No Further Action	1. SWMU Not Previously Investigated 4. Active 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - some secondary containment, but designed to prevent leakage, and several layers of asphalt with trench and sump system. No Further Action
130	WWTP-Isolation Tank No. 3	See SWMU 127	1999 - See SWMU 127.	Have photo. See SWMU 127	No Further Action	1. SWMU Not Previously Investigated 4. Active 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - some secondary containment, but designed to prevent leakage, and several layers of asphalt with trench and sump system. No Further Action
131	WWTP-Equalization Tank	See SWMU 127	1999 - See SWMU 127.	Tank was removed and replaced with new tank in 2011. Have photo. See SWMU 127	No Further Action	1. SWMU Not Previously Investigated 4. Active 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - some secondary containment, but designed to prevent leakage, and several layers of asphalt with trench and sump system. No Further Action
132	WWTP-Cooling Tower and Sump	See SWMU 127	1999 - See SWMU 127.	Tank was removed and WAS Building is now in the same location. Have photo. See SWMU 127	No Further Action	1. SWMU Not Previously Investigated 4. Active 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - some secondary containment, but designed to prevent leakage, and several layers of asphalt with trench and sump system. No Further Action
133	WWTP-Mix Box	See SWMU 127	1999 - See SWMU 127.	Have photo. See SWMU 127	No Further Action	1. SWMU Not Previously Investigated 4. Active 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - some secondary containment, but designed to prevent leakage, and several layers of asphalt with trench and sump system. No Further Action
134	WWTP-Aerator No. 1	See SWMU 127	1999 - See SWMU 127.	Have photo. See SWMU 127	No Further Action	1. SWMU Not Previously Investigated 4. Active 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - some secondary containment, but designed to prevent leakage, and several layers of asphalt with trench and sump system. No Further Action

Table 1
Belle SWMUs Summary Information
DuPont Belle Plant, Belle West Virginia

SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
135	WWTP-Aerator No. 2	See SWMU 127	1999 - See SWMU 127.	Have photo. See SWMU 127	No Further Action	1. SWMU Not Previously Investigated 4. Active 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - some secondary containment, but designed to prevent leakage, and several layers of asphalt with trench and sump system. No Further Action
136	WWTP-Aerator No. 3	See SWMU 127	1999 - See SWMU 127.	Empty for maintenance when evaluated. Have photo. See SWMU 127	No Further Action	1. SWMU Not Previously Investigated 4. Active 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - some secondary containment, but designed to prevent leakage, and several layers of asphalt with trench and sump system. No Further Action
137	WWTP-Aerator No. 4	See SWMU 127	1999 - See SWMU 127.	Have photo. See SWMU 127	No Further Action	1. SWMU Not Previously Investigated 4. Active 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - some secondary containment, but designed to prevent leakage, and several layers of asphalt with trench and sump system. No Further Action
138	WWTP-Aerator No. 5	See SWMU 127	1999 - See SWMU 127.	See SWMU 127	No Further Action	1. SWMU Not Previously Investigated 4. Active 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - some secondary containment, but designed to prevent leakage, and several layers of asphalt with trench and sump system. No Further Action
139	WWTP-Clarifier No. 1	See SWMU 127	1999 - See SWMU 127.	Rebuilt in 2009-2010. Have photo. See SWMU 127	No Further Action	1. SWMU Not Previously Investigated 4. Active 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - some secondary containment, but designed to prevent leakage, and several layers of asphalt with trench and sump system. No Further Action
140	WWTP-Clarifier No. 2	See SWMU 127	1999 - See SWMU 127.	Have photo. See SWMU 127	No Further Action	1. SWMU Not Previously Investigated 4. Active 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - some secondary containment, but designed to prevent leakage, and several layers of asphalt with trench and sump system. No Further Action

Table 1
Belle SWMUs Summary Information
DuPont Belle Plant, Belle West Virginia

SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
141	WWTP-Clarifier No. 3	See SWMU 127	1999 - See SWMU 127.	See SWMU 127 SWMUs 141 and 142 were replaced by a single clarifier. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Active 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - some secondary containment, but designed to prevent leakage, and several layers of asphalt with trench and sump system. No Further Action
142	WWTP-Clarifier No. 4	See SWMU 127	1999 - See SWMU 127.	See SWMU 127 SWMUs 141 and 142 were replaced by a single clarifier. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Active 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - some secondary containment, but designed to prevent leakage, and several layers of asphalt with trench and sump system. No Further Action
143	WWTP-Clarifier No. 5	See SWMU 127	1999 - See SWMU 127.	Have photo. See SWMU 127	No Further Action	1. SWMU Not Previously Investigated 4. Active 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - some secondary containment, but designed to prevent leakage, and several layers of asphalt with trench and sump system. No Further Action
144	WWTP-Sludge Storage Tank	See SWMU 127	1999 - See SWMU 127.	Have photo. See SWMU 127	No Further Action	1. SWMU Not Previously Investigated 4. Active 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - some secondary containment, but designed to prevent leakage, and several layers of asphalt with trench and sump system. No Further Action
156	WCS Pumping Station	See SWMU 145	1999 - See SWMU 145. 2012 - In SSS area, lots of previous investigations and sampling resulting in installation and operation of current DPE system and additional sampling conducted under the Phase II ESA prior to leasing to Kureha.	Abandoned. Area is under Kureha trailers. Have photo. See SWMU 145 Investigated with SWMUs 4, 8, 11, 14, and 184.	No Further Action	1. Previously Investigated - during the Belle Manufacturing Area Phase II Investigation (DuPont CRG, 2008) 2. No evidence of a release No Further Action
174	Consolidated Waste Drum Storage Area	This unit is a metal building constructed to manage various containerized wastes (maximum of 23,760-gallons).	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit has good secondary containment.	Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive, but in use 6. Above Ground 7. No Releases 8. Reliable Secondary Containment – concrete floor with trench and sump No Further Action

Table 1
Belle SWMUs Summary Information
DuPont Belle Plant, Belle West Virginia

SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
175	Former Container Storage Area O	This unit is a 20-ft. wide by 30 ft. long, concrete pad surrounded by a 6-inch concrete curb. This RCRA regulated unit was closed in June 1988.	1999 - No information on releases at this SWMU was available in the file material. Unit had good secondary containment.	In use. The pad without a roof was converted into SWMU 174, the Consolidated Waste Drum Storage Area. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive (closed) 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - concrete pad with curbs No Further Action
176	Central Shop Container Storage Area F	This unit is a 10-ft. long, 4 ft. wide, and 4-inch thick concrete pad. The unit is fenced in by a 10-ft. cyclone- locking fence. This RCRA regulated unit was closed in 1991.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit has good secondary containment.	Area is used as a sheltered smoking area. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive, but used 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - concrete pad with “catch pallets’, asphalt on three sides of unit and other side is an exterior building wall No Further Action
177	PCB Storage Area	This unit is a 15-ft. by 20-ft. and 20 ft. high corrugated metal building. The building has a concrete floor which slopes to the center to a sump. This unit manages oil contaminated with PCB and various drained equipment.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit has good secondary containment.	Area is not used for PCB storage at this time. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive, but in use 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - concrete floor slopes to sump No Further Action
178	Former PCB Storage	This unit is a 20-fl. by 24-fl. area located on the first floor of a building at A-Plant. This unit managed oil contaminated with PCB and various drained equipment. This unit was dismantled in 1991.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit has good secondary containment.	Area is now a long concrete pad and is used as a trailer parking area. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
179	Former Paint Shop Container Storage Area H	This unit is a 5 ft. by 10-ft., 110-gallon concrete pad. The unit managed acetone and paint thinner. This RCRA regulated unit was closed in July 1987.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit has good secondary containment.	Area was in use as a smoking area, but is now in use as a spent fire extinguisher storage area. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive, but used 5. No Closure Documentation Located, but institutional knowledge indicates closed according to regulations No Further Action
180	Auto Shop Steam Cleaning Pad	This unit is a curbed 30-fl. by 10-fl. concrete pad which was used for vehicle washing. This unit received wash water and minor amounts of oils and greases.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit has good secondary containment.	In use. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Active 6. Above Ground 7. No Releases 8. Reliable Secondary Containment - concrete pad with curbs drains to WWTP No Further Action

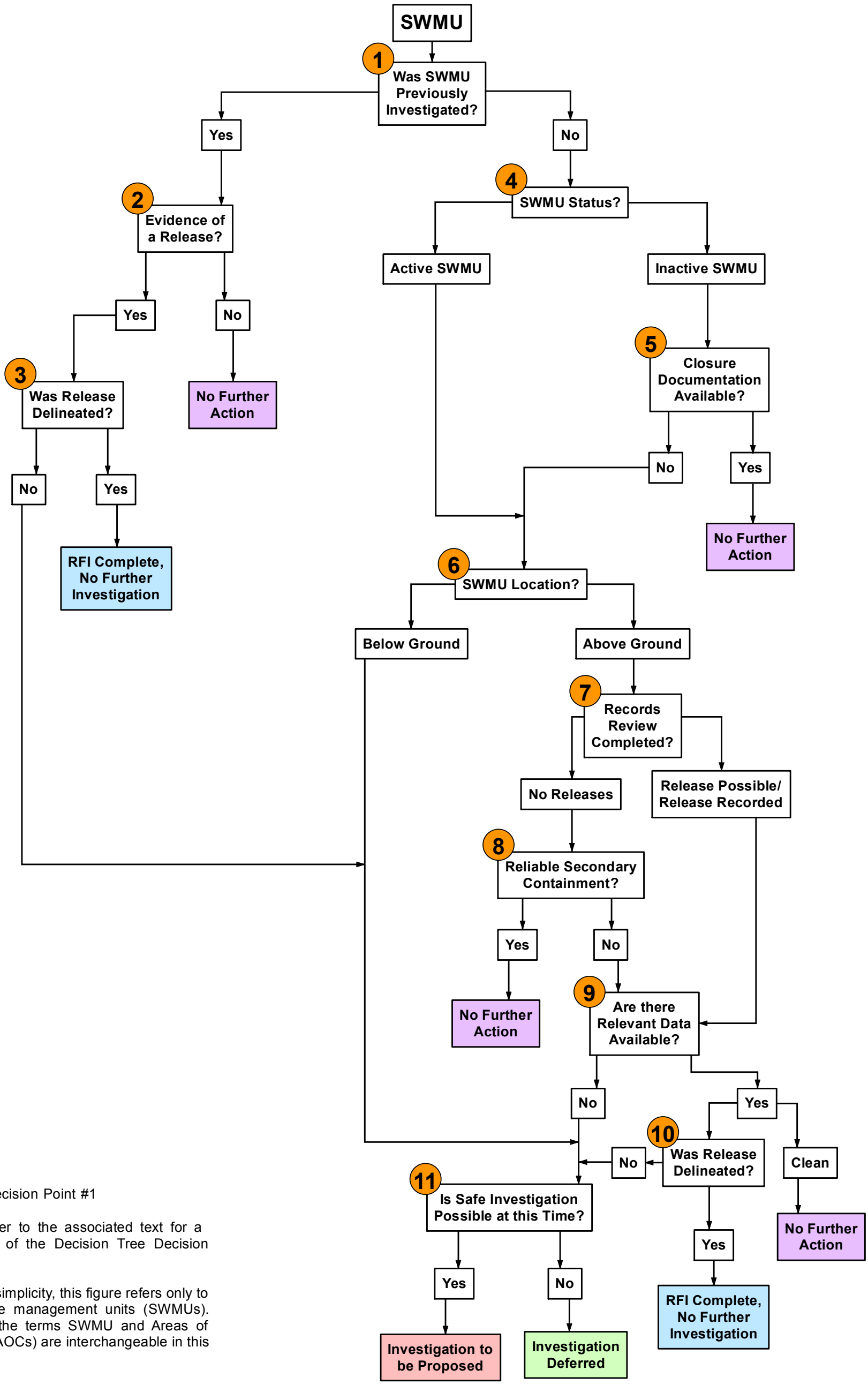
Table 1
Belle SWMUs Summary Information
DuPont Belle Plant, Belle West Virginia

SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
181	Nonhazardous Waste Storage Area	These areas served to store nonhazardous wastes prior to disposal off-site.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit has good secondary containment.	Not located in 2012	No Further Action	1. SWMU Not Previously Investigated 4. Active 6. Above Ground 7. No Releases 8. Reliable Secondary Containment – drummed wastes were on pallets and locations were indoors, outdoors locations were on asphalt or concrete No Further Action
183	Former Injection Well No. 2	The unit was used to dispose of aqueous wastes from the manufacture of nylon intermediates until 1971. From 1972 until 1980, the unit was used to dispose of MDA waste brine. This unit was a 5,400-ft. deep injection well with a final diameter of 8-518 inches. The well was plugged in November 1981 per WV State Requirements.	1999 - The unit was designed to discharge brine wastes to several permitted zones within the underlying aquifer. Leaks were discovered in the injection well casing in 1975 and in 1976. The amount of waste brine which entered unpermitted injection zones is not known.	Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive and closed 5. Closure Documentation on steel plate on well cover No Further Action
184	Former Injection Well No. 3	This unit was used to dispose of MDA waste brine. This unit was a 5,147-ft. deep well with a final diameter of 9-518 inches. The well had two injection zones. The well was plugged in June 1985 per WV State Requirements.	1999 - The unit was designed to discharge brine wastes to several permitted zones. A leak was discovered in the injection well casing in 1984. Approximately 10 to 20 gallons per day leaked into unpermitted injection zones. There releases were determined to be within UIC program guidelines.	Have photo. Investigated with SWMUs 4, 8, 11, 14, and 156.	No Further Action	1. Previously Investigated - during the Belle Manufacturing Area Phase II Investigation (DuPont CRG, 2008) 2. No evidence of a release No Further Action
185	Tank Wagons	These units are used to transport wastes from the process areas to the SAR Furnace (SWMU 93) or the Coal/Waste Fired Boilers (SWMUs 15-19).	1999 - Infrequent leaks/spills of minor amounts of material have occurred from the units. The spills were reportedly cleaned-up after each occurrence.		No Further Action	Tank wagons used throughout the site. Tanks were generally loaded an unloaded on pads which had release controls. Technically infeasible to investigate so will rely on groundwater quality to identify associated issues. No Further Action
186	Asbestos Dumpsters	This unit consists of two steel trash dumpsters which are each 7-ft. wide x 15-ft. long x 4 ft. high. The units are open topped and are located on an asphalt or gravel pads. The asbestos materials are sealed in heavy plastic bags and placed in the dumpsters.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR.		No Further Action	1. SWMU Not Previously Investigated 4. Active 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Reliable Secondary Containment – asbestos materials are sealed in heavy plastic bags and are placed a steel trash dumpsters on either an asphalt or gravel pad No Further Action
187	F&G Sump Tank	The unit is a 210-gallon carbon steel tank which was used to collect waste water generated throughout the F&G Building. The unit is mounted horizontally and rests on steel legs within a below-grade poured concrete vault. Currently, this unit is used to collect rain water.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit has good secondary containment.	Tank was removed and area is now paved and/or covered with concrete. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive and removed 5. No Closure Documentation 6. Above Ground 7. No Releases 8. Reliable Secondary Containment – below-grade poured concrete vault No Further Action

Table 1
Belle SWMUs Summary Information
DuPont Belle Plant, Belle West Virginia

SWMU #	SWMU Name	SWMU Description [from Current Conditions Report (1999)]	Comments [from Current Conditions Report (1999)*]	2012 Status	Decision Tree Result	Decision Tree Evaluation Rational (Numbers refer to Decision Points in the Decision Tree, See Figure 1.)
188	F&G Wastewater Storage Tank	This unit is a vertical, 14,250-gallon, stainless steel tank which was used to collect and treat wastewater contaminated with sulfonylurea herbicides. The tank is mounted on steel legs within a poured concrete containment basin. Currently, this unit is used to collect rain water.	1999 - No releases at this SWMU are known or suspected. No evidence of a release observed during VSI or PR. Unit has good secondary containment.	Tank was removed and area was paved. Have photo.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive and removed 5. No Closure Documentation 6. Above Ground 7. No Releases Reliable Secondary Containment - concrete containment basin No Further Action
AOC C	AOC C Raw Material and Product Loading/Unloading Areas	The areas receive raw materials from tanker trucks, railcars, and containers. Locations are either paved with asphalt or concrete or gravel covered soil.	1999 – All Unloading areas visited during the VSI were noted to be in good condition and had absorbent materials for spill control.	Not observed in 2012	No Further Action	1. SWMU Not Previously Investigated 4. Inactive 5 No closure documentation 6. Above Ground 7. No Releases 8. Reliable Secondary Containment – All areas have absorbent materials for spills and good housekeeping 9. Relevant Data – wells downgradient along river show no sign of release No Further Action
AOC D	AOC D Riverside Raw Material Unloading Areas	These areas located along the Kanawha River are used to unload raw materials from barges or other ships. The areas have booms which connect with the tankers and unload the material into onsite tanks. Materials received include coal and acetone. This unit was removed in 1993.	1999 - Past practice at the coal unloading area included the release of coal into the river. An upgrade to the conveyor system has been completed and rip-rap has been installed along the river bank.	Various locations along the river. Not observed during the reconnaissance in 2012.	No Further Action	1. SWMU Not Previously Investigated 4. Inactive 5 No closure documentation 6. Above Ground 7. Known Releases of coal into the River, but conveyor house and conveyor system were enclosed and riprap installed on riverbank to eliminate future releases 8. Reliable Secondary Containment 9. Relevant Data – wells downgradient along the river show no sign of release No Further Action
AOC B	AOC B Southwest Groundwater Seep	The seep is located along the bank of the Kanawha River. The seep was discovered in August 1989 when an oil-like sheen was noted on groundwater discharging to the river from the shallow overburden.	1999 - The seep was discovered in August 1989 when an oil-like sheen was noted on groundwater discharging to the River from the shallow overburden. Sampling was conducted in June and September 1989. Metals, PAHs, acetone, and benzene were reported at elevated higher levels.	Still exists. Have photo.	No Further Investigation	1. Previously Investigated 2. Evidence of a Release 3. Release Delineated and duel phase extraction system installed as an interim measure during the fourth quarter 2005 and currently operating No Further Investigation

Information in this column is copied directly from Tables 8.1 of the Current Condition Report. In Table 8.1, the sentence “No evidence of a release observed during VSI or PA.“ is listed. This sentence should have read “No evidence of a release observed during VSI or PR. “ where VSI stands for the Visual Site Inspection and PR stands for Preliminary Review. This has been corrected in this Table.



1 = Decision Point #1

Please refer to the associated text for a discussion of the Decision Tree Decision Points.

Note: For simplicity, this figure refers only to solid waste management units (SWMUs). However, the terms SWMU and Areas of Concern (AOCs) are interchangeable in this figure.

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Newark, DE 19713

BELLE PLANT AREA SWMU DECISION TREE

DUPONT BELLE PLANT
BELLE, WEST VIRGINIA

FILE NUMBER:	PROJECT NUMBER: 18986236
DESIGNED BY: KLD	DATE: 06/26/2012
DRAWN BY: CAA	FIGURE NUMBER: 1
DATA QUALITY CHECK BY: KLD	

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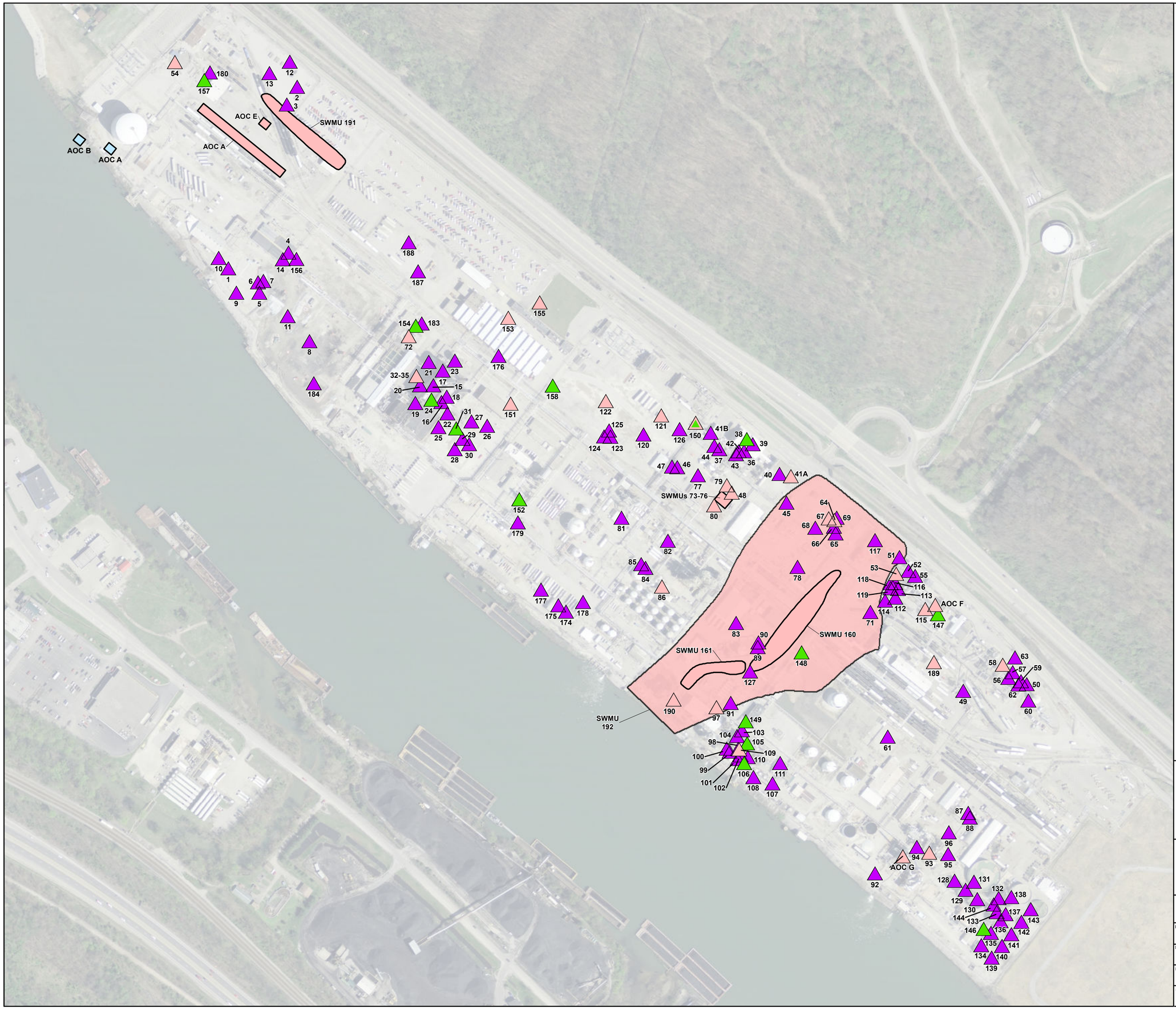

Legend

- Investigation to be Proposed
- Investigation Deferred
- RFI Complete
- No Further Action
- Investigation to be Proposed/ InvestigationDeferred

Notes:
The following SWMUs and AOCs are not shown on this figure as they had multiple locations across the site or are units which changed locations at different times (e.g., Asbestos Dumpsters):

- SWMU 145 - Investigation Deferred
- SWMU 181 - No Further Action
- SWMU 185 - No Further Action
- SWMU 186 - No Further Action
- AOC C - No Further Action
- AOC D - No Further Action

Aerial Source: World Imagery provided via ESRI online at services.arcgisonline.com. Aerial Credit: ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGP.

N W E S

0 125 250 500

Feet

1 inch = 250 feet

MAP FORMATTED FOR "C" (17" X 22") SIZE SHEET.
TEXT SCALE NOT VALID FOR DIFFERENT PAGE SIZE.

URS Corporation
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Newark, DE 19713

BELLE PLANT AREA SWMU DECISION TREE EVALUATION RESULTS

DUPONT BELLE PLANT
BELLE, WEST VIRGINIA

FILE NUMBER:	PROJECT NUMBER: 18986236
DESIGNED BY: KLD	DATE: 10/02/2012
DRAWN BY: CAA	FIGURE NUMBER: 2
DATA QUALITY CHECK BY: KLD	

Appendix B

High Resolution Vertical Profiling System Operating Procedures

STANDARD OPERATING PROCEDURES (SOP)
for
MEMBRANE INTERFACE PROBE SYSTEM

Prepared by:

COLUMBIA Technologies, LLC
1448 S. Rolling Rd, Baltimore, MD 21227, 410-536-9911 Fax: 410-536-0222

STANDARD OPERATING PROCEDURES (SOP)
for
MEMBRANE INTERFACE PROBE SYSTEM

Reviewed By:	Title	Signature	Date
John H. Sohl, III	CEO		06/01/2011

1.0 BACKGROUND

The Membrane Interface Probe (MIP) system is a multipurpose tool for mapping soil and groundwater contamination, specifically volatile organic compounds (VOCs) such as halogenated solvents and petroleum compounds. MIP used for the detection and measurement of VOCs vertically through the subsurface. As a continuous VOC sampling system which heats the soil, water, and vapor matrix is driven into the subsurface, the MIP maps contaminants within the groundwater and the surrounding soil. The VOC mass which is extracted across a semi-permeable membrane is carried to the surface by an inert purge gas via small diameter inert tubing. Once the compounds reach the surface they are analyzed by a suite of laboratory grade detectors. The sensor detection system includes:

- Photo Ionization Detector (PID),
- Flame Ionization Detector (FID) , and a
- Halogentated Compound Detector (either an ECD [Electron Capture Detector], XSD™ [Halogen Specific Detector], or a DELCD [Dry Electrolytic Conductivity Detector])

Together, these three detectors offer a range of sensitivities and a means of discriminating different classes of compounds – from chlorinated solvents to gasoline hydrocarbons to methane soil gas. The use of multiple detectors is important for separating different types of contamination such as petroleum (retail gasoline station) from chlorinated solvents (dry cleaners). The complementary range of performance of the different detectors enables the system to function from low contaminant levels to near NAPL levels.

1.1 APPLICATIONS IN A RANGE OF IN-SITU CONTAMINANT CONCENTRATIONS

The standard flow rate for the nitrogen within the transfer line is 40 mL/min. This can vary depending on the ambient air temperatures and the approximate concentrations

of the contamination. If the ambient air is 40 degrees or lower, the flow should be increased to 50 mL/min. If the site investigation is focused on locating lower concentrations such as defining the outer edge of a plume, or the contaminant of concern is a known "low responder", the flows can be adjusted to be within 20-30 mL/min as deemed appropriate by the operator. When looking for high levels of contamination in source areas or NAPLs, the flow may be increased to be within 50-60 mL/min.

2.0 SETUP

When looking at the back of the controller box, on the right hand side, there is a port labeled Nitrogen Source. This is where the nitrogen supply enters the system. To the left of the nitrogen source is the input for detector 1 and detector 2. The green connector, which is the detector electrometers, is inserted here.

A trunk line connects the MIP probe to a controller box and the GC; the following assumes that a trunk line is already connected to the probe. The trunk line consists of 5 wires, 1/16" down line Teflon tubing, and 1/16" return PEEK tubing. The brown wire is the thermocouple wire and is made up of 2 individual wires, red and yellow. These two wires are connected to the male thermocouple connector (yellow). The red wire goes to the negative pole, and yellow to the positive: the +/- is clearly marked on the connector itself. The male thermocouple connector then gets inserted into the female connector labeled *Thermocouple* at the back of the controller box. The remaining 4 wires are associated with the *Heater and Conductivity* connector. The probe heater wires (both yellow) are connected to the top 2 lugs of this connector. The Dipole soil conductivity wires (red/white) are connected to the bottom 2 lugs of the connector. The 2 lengths of tubing should always be joined by a female-to-female adaptor when not attached to the controller box and GC. This is to prevent any particulate matter from getting inside the tubing and potentially causing a clog. The first length of tubing is always connected to the port labeled *Regulated Out* at the back of the controller box first. This is so that any particulate matter that may have entered into the tubing is expelled, be sure that nitrogen is flowing through the controller box. The second length of tubing is then connected to the inlet of the dryer tube. When attaching gas lines they are to be hand tight and then a ¼ turn with a wrench.

3.0 START UP

- Check to ensure that nitrogen has greater than 400 psi, replace tank if lower
- Turn on nitrogen source, and check that regulator reads 60 psi out
- Confirm ~20psi on Prime Regulator gauge and record in log
- Power on GC, confirm proper detector temperatures
- Power on MIP controller box

- Power on PID lamp and PID heater
- Power on air compressor and turn on hydrogen (60 psi)
- Light FID
- Check flows and membrane…section 5.1
- Turn controller box probe heater switch to on
- Power on laptop or field computer
- Open MIP software.
- Response check…section 5.2

3.0 LOGGING PROCEDURES

- Use a rotary drill steel, or pre-probe punch to create a pilot hole if going through asphalt or concrete.
- Place the rod wiper under the foot of the probe, and line it up with the pilot hole.
- Put the slotted drive cap on the probe drive head, and insert the probe into the hole in the rod wiper, so that the tip of the probe is even with the ground.
- Connect the umbilical and string-pot…section 5.4
- Check the pressure readings, temperature and detector baselines.
- Press the trigger to on position and commence probing.
- Advance the probe 1-foot at a hammer rate determined by **COLUMBIA**'s analyst, wait 30 seconds, repeat to refusal.
- If necessary change the attenuation of the GC and the MIP if the response begins to approach the end of the current range. (see section 5.2)
- If the contaminant is known to exist at or below a certain depth, it is acceptable to push straight to that depth without stopping. The log will still provide accurate depth and conductivity data.
- When looking for NAPL, it may be useful to push through different intervals rather than "stop and hold" as deemed necessary.
- Once the target depth or equipment refusal has been reached, wait 15 seconds longer than the determined trip time and turn the trigger "off".
- Release the string-pot string from the counter weight, and disconnect the umbilical, insert cotter pin in counter weight whenever rig is in motion.
- Using DI Viewer, recall the appropriate file, adjust the scaling to the predetermined uniform scale, check for anomalies and edit appropriately
- Print out MIP log if client requests.
- Upload the MIP log data files and performance test files per SmartData Solutions® SOP

4.0 RETRIEVAL AND INSPECTION

- Start pulling rods out of the ground, and replace on rod rack.
- Rod wiper will normally suffice for decon unless otherwise specified by client.
- If high levels were encountered, it may be useful to clean the membrane with methanol.
- Prior to the next location, visually inspect the probe and tighten if necessary, check for changes in back flow pressures and temperatures.
- If moving system to perform another log, prepare equipment for travel and repeat the above procedures. If there are no more logs to perform shutdown the system…section 5.5

5.1 FLOW TESTS

There are several critical flows that need to be monitored, and possibly adjusted to maximize the efficiency of the MIP system. These include the pressure from the supply tank to the prime regulator, the flow rate throughout the transfer line, the mass flow, and the flow rate inside the dryer tube. This is done at the beginning of everyday, and again if deemed necessary by **COLUMBIA**'s analyst due to changing field conditions.

- The prime regulator on the front of the MIP controller box should be set to ~20 psi using a small flathead screwdriver.
- Disconnect the nitrogen line at the trunkline exit and attach a 1/16" female-to-female adaptor.
- Insert adaptor into the flow meter line.
- Adjust the mass flow dial with small adjustments until the meter reads ~40 mL/min or alternate predetermined rate.
- Reconnect and check flow coming out of the controller box. The difference should be less than 5mL/min.
- Lock the mass flow dial in place, and record both mass flow and dial setting.
- Disconnect the nitrogen line, and attach the meter to the outlet of the dryer tube.
- The measured flow out of the Dryer tube should be ~80 mL/min.
- Adjust the flow accordingly using the control valve on the opposite end of the dryer tube.
- Disconnect the meter and reconnect gas lines.
- Check membrane for excessive leaks with Snoop or similar leak detector.
- If bubbles appear around the perimeter of the membrane, use membrane wrench to tighten, and check again.
- If excessive leak at center of membrane, replace membrane…(refer to section 5.4)

5.2 QUALITY ASSURANCE RESPONSE CHECK and TRIP TIME

Although the MIP system cannot be calibrated, the system can be monitored for reproducibility and proper performance. Using detector specific compounds, a response check is performed before every MIP log. This procedure can performed using solvent vapors (a "Response Test"), or using aqueous solutions of known compounds (a "Performance Test").

5.2.1 RESPONSE TEST

This is done by introducing the headspace of a neat organic compound to the membrane, and then measuring the response against pre-set acceptable limits. The "trip time", or the time it takes for a mass to move across the membrane and cause a detector response, needs to be measured at the time of a response check.

- Scroll the MIP software up to view the response vs. time screen
- To determine the trip time, introduce Butane from a lighter into the membrane for 5 seconds while simultaneously starting a stopwatch.
- Record the time it takes for butane to get from the membrane to when you first see a response on the screen.
- This value is entered into the MIP software on the main screen when starting a new log, and recorded in the field log.
- Continue with the response checks by choosing the appropriate compound. For the PID use neat benzene, the ECD use neat trichloroethylene and for the FID use the butane from a lighter.
- Introduce the vapor for 5 seconds.
- Record the response that appears on the screen.
- The response should be greater than 1E+6 mV.

5.2.2 PERFORMANCE TEST

A performance test is used to evaluate detector response from target compounds in aqueous solution. Standard compounds such as Benzene and TCE are also commonly used for performance tests, but specific target compounds for a site may be used as well. The "trip time", or the time it takes for a mass to move across the membrane and cause a detector response, needs to be measured at the time of a performance check.

- Scroll the MIP software up to view the response vs. time screen
- To determine the trip time, introduce Butane from a lighter into the membrane for 5 seconds while simultaneously starting a stopwatch.
- Record the time it takes for butane to get from the membrane to when you first see a response on the screen.
- This value is entered into the MIP software on the main screen when starting a new log, and recorded in the field log.

- Continue with the performance checks by choosing the appropriate compound. For the PID use a benzene solution (or other site-specific target compound), the halogen detector use a trichloroethylene solution (or other site-specific compounds). The FID response is still evaluated using butane from a lighter unless some site-specific compound is chosen for testing.
- Prepare Stock Standard of compound(s) of interest (see MIPS Performance Test Solution Prep spreadsheet)
- Immerse the probe in a container of clean water (commonly a 2" PVC tube) to stabilize the baseline.
- Check the stability of the detector vs time data on the MIP software
- Prepare 500 ml Testing standard from Stock Standards, place in 2" PVC Tube.
- Insert the probe into the test solution of known concentration for 45 seconds
- Return the probe to the tube containing clean water if using.
- Record trip time and response for each detector in field notes
- Compare results to previous measurements
- If the result varies more than 50% for any detector, begin trouble-shooting evaluation. Note any corrective actions performed in field notes

5.3 DEPTH MEASURING STRING-POT

Attach the string-pot to the string-pot bracket, and then to the main anchoring bolt of the probe hammer. The string-pot bottom clamp must then be bolted to the foot of the hammer. Prior to operation, the cotter pin is to be removed from the foot bracket so that the counter weight is free to move, and then inserted into the eyebolt on top of the counter weight. When the string or cable connects these two devices, the cable should be parallel to the probe and perpendicular to the ground. It is essential that the string-pot cable be connected to the counter weight prior to the activation of the trigger, or the depth measurements will not be accurate. The umbilical should be attached to the string-pot before the activation of the trigger as well.

5.4 MEMBRANE REPLACEMENT

It is important to note that while completing the following procedure to use great care when screwing in the new membrane. Be sure that the threads do not become cross-threaded. This would make a complete seal impossible, which will then greatly hinder the performance of the MIP system.

- Secure the probe.
- Clean the membrane and surrounding area thoroughly.
- Clean out the 4 holes in the membrane with a dental pick or small flathead screwdriver

- Using the membrane wrench, carefully unscrew the membrane while applying equal pressure to the top of the membrane.
- Remove the membrane, and use the pick to clean up the interior threads of the probe, while blowing out the freed dirt.
- Remove the washer carefully so to not allow any dirt to fall into the chamber.
- Insert a new washer
- Thread the new membrane into position, and tighten with the membrane wrench.
- Using Snoop, check for leaks around the perimeter of the membrane.
- If bubbles appear around the edge, use the wrench to tighten more.
- Continue to tighten, until there is a complete seal.
- There should be a certain amount of gas escaping through the center of the membrane as a foam; this is acceptable.

5.5 SHUTDOWN PROCEDURES

- Turn off the power supply to the heater.
- Turn off the PID lamp and heater.
- Turn off GC.
- If using FID, close the valve to the tank of hydrogen.
- When the probe temperature has returned to ambient, turn off power to MIP controller box.
- Close the valve to the tank of nitrogen.
- Shutdown the computer.
- Shutdown the generator.

6.0 REFERENCES

- Geoprobe® Membrane Interface Probe SOP, Revision June, 2009
- ASTM D7352-07

MIP PERFORMANCE TEST SOLUTION PREP

50 MG/ML STOCK -- 100, 10, AND 1 MG/L (PPM) SOLUTIONS IN 500 ML DI

Compound Name	Density	25 ml of 50 mg/mL Stock from neat in 25 ml MEOH	10 ml of 50 mg/mL Stock from neat in 10 ml MEOH	Volume 0f 50 mg/L Stock for 100 mg/L in 500 ml DI	Volume 0f 50 mg/L Stock for 10 mg/L in 500 ml DI	Volume 0f 50 mg/L Stock for 1 mg/L in 500 ml DI
	(g/L)	(uL)	(uL)	(uL)	(uL)	(uL)
Trichloroethylene	1.4642	854	341	1000	100	10
Methylene Chloride	1.33	940	376	1000	100	10
1,2 Dichloroethylene	1.27	984	394	1000	100	10
1,1-Dichloroethylene	1.213	1031	412	1000	100	10
1,1,2,2-Tetrachloroethane	1.586	788	315	1000	100	10
Benzene	0.8765	1426	570	1000	100	10
Toluene	0.87	1437	575	1000	100	10
Tetrachloroethylene	1.6227	770	308	1000	100	10
Carbon Tetrachloride	1.594	784	314	1000	100	10
Chlorobenzene	1.106	1130	452	1000	100	10
1,1,1-Trichloroethane	1.3376	935	374	1000	100	10
1,1,2-Trichloroethane	1.442	867	347	1000	100	10
1,1-Dichloroethene	1.2129	1031	412	1000	100	10
1,4-Dichlorobenzene	1.241	1007	403	1000	100	10
MTBE	0.7404	1688	675	1000	100	10
Hexanes	0.6603	1893	757	1000	100	10
MEK (2-butanone)	0.81	1543	617	1000	100	10
Ethylbenzene	0.87	1437	575	1000	100	10
m-Xylene	0.86	1453	581	1000	100	10
o-Xylene	0.88	1420	568	1000	100	10
p-Xylene	0.86	1453	581	1000	100	10
Methylene Chloride	1.33	940	376	1000	100	10
Diesel	0.81	1543	617	1000	100	10
Naphthalene	1.15	1087	435	1000	100	10
Acetone	0.79	1582	633	1000	100	10
1,2-Dichloroethane	1.24	1008	403	1000	100	10
Trichlorfluoromethane	1.374	910	364	1000	100	10
1,1-Dichloroethane	1.18	1059	424	1000	100	10
1,2-Dibromoethane	2.1	595	238	1000	100	10
tert_Butyl Alcohol (TBA)	0.79	1582	633	1000	100	10

STANDARD OPERATING PROCEDURES (SOP)
for
HYDRAULIC PROFILING TOOL SYSTEM

Prepared by:

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STANDARD OPERATING PROCEDURES (SOP)
for
HYDRAULIC PROFILING TOOL SYSTEM

Reviewed By:	Title	Signature	Date
John H. Sohl, III	CEO		06/01/2011

1.0 BACKGROUND

The Hydraulic Profiling Tool (HPT) uses direct pressure response measurements of hydraulic permeability to determine migration pathways, remediation injection regions, and placements for monitoring wells.

The pressure response of the soil to injection of water is measured to indicate the soil grain size. Real-time continuous data can be produced in both fine and coarse grained material with saturated or unsaturated conditions.

The system consists of two sensors:

- A sensitive downhole transducer to record dynamic pore pressure
- An electrical conductivity sensor providing information on lithology

While most soil profiling methods *infer* permeability from parameters like grain size or geotechnical properties, the HPT system can measure continuous data on hydraulic permeability directly by injecting water into the formation. Additionally, the Hydraulic Profiling Tool can conduct static dissipation tests at individual depths. This data is used to determine static water level (or head pressure in confined aquifers) and hydraulic conductivity.

1.1 APPLICATIONS

The Hydraulic Profiling Tool (HPT) allows the user to create fast, continuous, real-time profiles of soil hydraulic properties in both fine-and coarse-grained material. The HPT uses a sensitive, downhole transducer to measure the pressure response of the soil to injection of water. The higher the pressure response on the data logs, the lower the zone of permeability, and inversely, the lower the pressure response on the data logs, the higher the zone of permeability. For purposes of locating and defining preferential migration pathways for contaminants in the subsurface, targeting zones for injection of remediation material, and selecting screen well intervals, evaluating locations to detect slug tests, and measuring static water conditions across a site, it is preferred to conduct these in higher zones of permeability, so therefore the pressure response on the data logs

would correlate with a lower reading.

2.0 SETUP

Complete Load List and assemble parts for HPT probe assembly, refer to the Geoprobe HPT SOP for parts identification and illustrations. Place o-ring on the MIP-LB Connection Tube (Wiring Cavity). Tape loose ends on the truck end of the Trunkline for stringing and then string trunkline through the MIP-LB tube, and MIP Drive Head. Do NOT string the strain-relief fitting and parts mentioned in the full SOP, those parts will be replaced by the water seal and spacer. String the trunkline through the rods to be used, add an extra 10% past the depth stated in the SmartScreen summary. Leave 15 to 20 feet of slack at the probe end of the Trunkline. Install an HPT screen and copper seal if not already present on the probe. Place an o-ring at the bottom of the HPT probe threads if not already present and then pull the inner tubing out of the yellow tubing about 3/8 inch. Cut the yellow tubing so that it extends about 2.5 inches from the top of the HPT probe threads. Insert the pointed end of the brass barbed quick connect fitting into the yellow tubing. This will push the inner tubing back into place inside of the HPT probe. Attach the single end of the Y fitting to the blunt end of the brass barbed quick connect fitting. Insert the blunt end of the second brass barbed quick connect fitting into one of the two holes on the other end of the Y fitting. Pack dielectric grease into both ends of the chrome connectors on the trunkline, also pack the ends of the connectors on the chrome fittings on the probe and HPT sensor.

Using the wiring cavity as a guide for length, cut a section of yellow tubing (from the service kit) to connect the HPT sensor to the Y connector. Attach the yellow tubing to the pointed end of the brass barbed quick connect fitting already placed in the Y connector. Attach the HPT sensor to the other end of this tubing, being careful not to break the barb on the HPT sensor. Connect the chrome connectors (packed with dielectric grease). Trim the nylon tubing in the trunkline to fit into the last opening of the Y connector. Wrap the EC wires around the other connections to reduce its length and tape into place and then hold the connections in place using several bands of tape rather than completely taping the connections to avoid moisture buildup trapped by the tape. Coat the threads of the HPT probe with Teflon pipe dope. Thread the MIP-LB tube into place. Be sure not to twist the internal connections. Use pipe wrenches to close the joint firmly. Do NOT

follow the SOP directions for installing the strain relief fittings. Place the ORANGE water seal in place over the trunkline. Place the two half spacers into the drive head, curved sides away from the water seal. Then, coat the threads of the MIP-LB tube with Teflon pipe dope. Thread the drive head onto the MIP-LB tube, use pipe wrenches to close the joint firmly. The HPT probe is now ready to be connected to the HPT controller.

3.0 START UP

- Run HPT trunkline (after stringing through the rods to be used) to the back of the location where the HPT controller is to be installed.
- Remove electrical tape from the loose wire ends, and attach the wires to the green electrical connectors as follows:
    - Transducer wires – attached to the port closest to the serial data port (DB-9 port going to the field computer) connection. Check the orientation of the green plug in the socket before beginning, because it is upside down as compared to all other uses of this connector for doing MIP. Once you have the orientation correct the wires are attached in the following order, top to bottom of the plug – Brown, Orange, Red. The bottom connection is not used.
    - Conductivity wires – attached to the port closest to the Field Instrument Interface (round plug going to the field computer) connection. This green plug is in the standard orientation as used for MIP. The wires are attached in the following order, top to bottom of the plug – White, Black, Yellow, Blue.
    - There are several other wires (grey, violet, green) which are not used. These wires can be taped to the trunkline to keep them out of the way.
- Attach the connections to the field computer mentioned above (DB-9 and round plugs). This is the same cable used to connect the Field Computer to the MIP controller.
- If not already attached, connect the other ends of this cable to the Field Computer in the usual locations.
- If not already attached, connect the stringpot cable to the Field Computer
- If not already attached, connect the power lead to the Field Computer
- Connect the plug from the SC Probe Test Jig to the Test Input socket on the Field Computer
- Attach the nylon tubing in the trunkline to the Injection Line socket on the back of

the HPT controller. To do so, trim the end of the tubing off square, and press the tubing into the socket firmly. Do not crush the tubing in the process by pushing too hard.

- Run the Water Supply Line (black plastic tubing with Brass quick-connect fittings on both ends) to the back of the HPT controller and attach it to the Water Supply Line quick connect fitting. This line has a male fitting on the end that goes to the pump, and a female fitting on the end that goes to the HPT controller.
- Run the other end of the Water Supply Line to the HPT pump quick connect fitting.
- Attach a standard garden hose to a water supply tank from which clean water will be gravity-fed to the HPT pump. Try to avoid water sources with particles in them, such as alge or sediment.
- Attach the male end of the garden hose to the HPT pump. A cut-off valve at that connection works well to prevent air from getting back into the line when the system is disconnected between locations. If a cut-off valve is in place, open it.
- Attach a power lead to the HPT controller
- Attach a power lead to the HPT pump. Use the GFI device and extension cord for this connection.
- The HPT system is now ready to be tested prior to use.

3.0 EC SYSTEM TESTING PROCEDURES

- Turn on the Field Computer and HPT Controller. Start the HPT software on the Field Computer. Both the EC and HPT components must be tested before logging is started.
- Secure the Wenner Array Test Jig connector to the test input jack on the back of the Field Computer (if not already attached in step 7 of the HPT Controller setup.
- Clean and dry the Wenner array pins as well as several inches of the probe body above the pins.
- Strap the probe to the Wenner Array Test Jig using the Velcro straps provided in such a way that the 4 pins on the test jig touch the 4 Wenner array pins on the probe. The last pin on the Wenner Array Test Jig should be in contact with the body of the probe, on the trunkline side of the Wenner array. A good way to get the correct orientation is to be sure that the wire coming off of the Wenner Array Test Jig is going in the same direction as the trunkline on the HPT probe.
- Start the HPT software, and choose “Test Instrument”. The Field Computer will

conduct a self-test and then check the EC probe for isolation and continuity. Once the tests are complete, a list of EC options are available. Select the appropriate EC array based on the probe test results. (Normally Wenner will be chosen. If one or more contacts have failed, top, middle , or bottom dipole choices can be made to continue logging without replacing the probe.)

Standard Parts

The following figure provides the standard parts for the UVOST. Prior to using the UVOST, these parts or satisfactory substitutions should be on hand or readily available when needed.

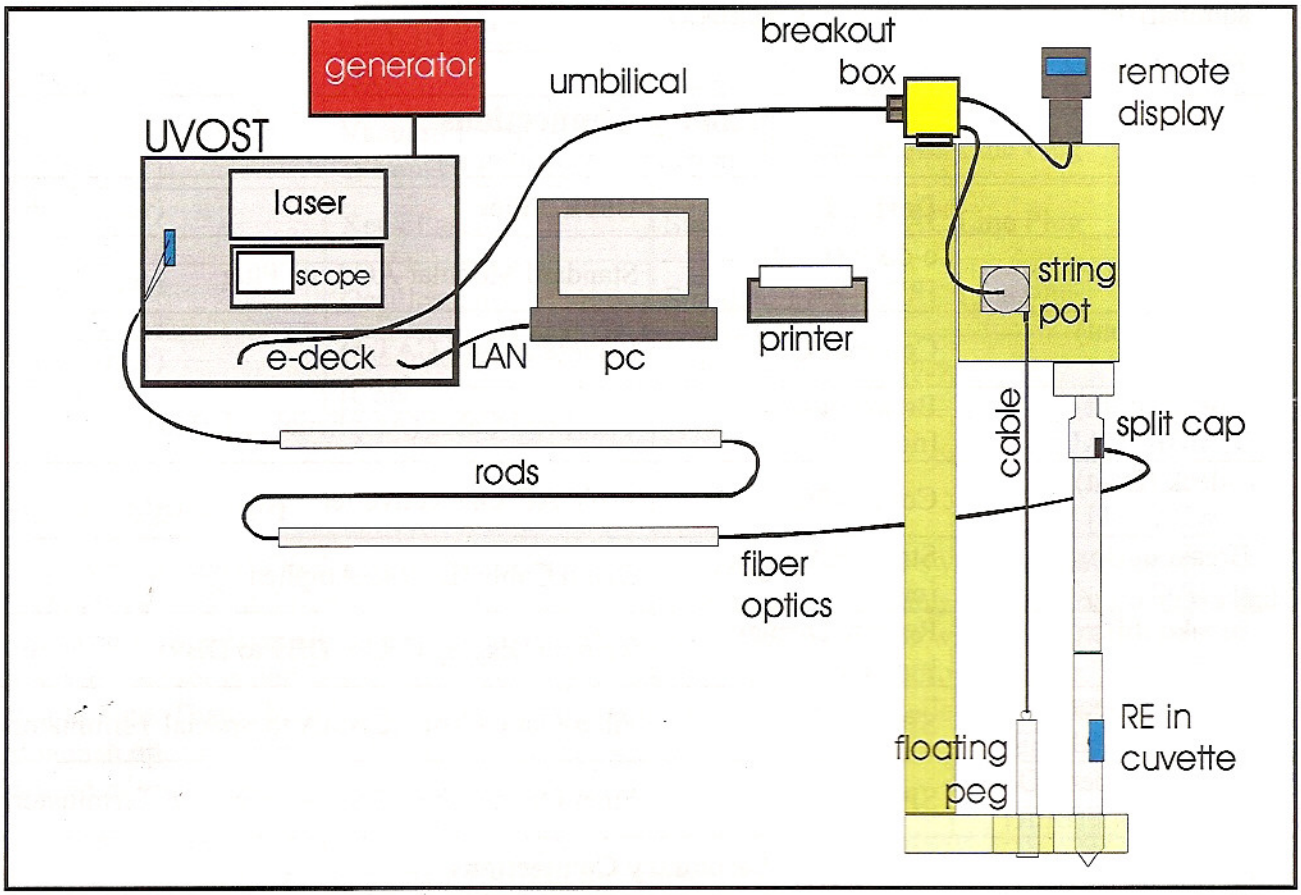

Figure 1. Standard UVOST parts.

General Operating Procedures

Set Up

Prior to operation, all the sub-systems require proper connections/cabling and power. Table 2 summarizes the proper connections/cabling.

Table 2. Cabling/Connections

Primary Connections [Connection labels in blue]		
Device 1	**Device 2**	**Cable/Fiber**
Power/Generator	e-deck (front) [PWR IN]	Standard Modular AC Line Plug
e-deck (front) [NET]	Control PC	LAN (standard CAT 5)
e-deck (front) [UMBILICAL]	Breakout Box [no label]	Umbilical Cable (Amphenol to DB15)
e-deck (front) [PWR OUT]	Control PC	110V AC Line converter
Breakout Box [DEPTH]	String Pot [no label]	Depth Cable (DB9 to Amphenol)
Breakout Box [DISLAY]	Remote Display [no label]	Remote Display Cable (DB9 to DB9)
UVOST Fiber I/O [LAUNCH FIBER]	SPOC	Fiber Optic Cable (2 SMA to Special Terminator)
UVOST Fiber I/O [RETURN FIBER]	SPOC	Fiber Optic Cable (2 SMA to Special Terminator)
Secondary Connections		
e-deck (front) [GPS]	GPS NMEA Output	DB9 RS-232 (Serial – usually integral to GPS)
e-deck (front) [AUX COM]	AD4 Quadrature	DB9 RS-232 (Serial)
e-deck (front) [12V AUX]	Generic 12V Accessory	Power Plug 0.1" (Switchcraft 761K)
Breakout Box [AUX]	NA (future use)	DB15 to (yet defined)

Permanent Connections		
Device 1	**Device 2**	**Cable/Fiber**
UVOST Fiber I/O (lower backside)	Detection Module (FIBER RETURN)	Single Fiber Optic (SMA-SMA)
UVOST Fiber I/O (upper backside)	Laser Launch Optics	Single Fiber Optic (High Power SMA-SMA) (standard fiber can be used as backup)
Trigger Photodiode	Oscilloscope [Ch1]	Coaxial Cable (SMA-BNC)
Emission Module [SIGNAL OUT]	Oscilloscope [Ch2]	Shielded Coax (PMT-BNC)

Trigger Photodiode	XeCl Laser (vessel)	Single Fiber Optic (SMA-SMA)
UVOST e-deck (rear) [NET SCP]	Oscilloscope	LAN (CrossOver CAT 5)
UVOST e-deck (rear) [12V PMT]	Detection Module [12V IN PMT]	12V supply (SMA-SMA)
AC Line (external)	NA	Standard Modular AC Line Plug
e-deck (rear left-most) [PWR OUT]	Vacuum Pump (switch at front of e-deck)	Standard Modular AC Line Plug
e-deck (rear) [PWR OUT]	XeCl Laser	Standard Modular AC Line Plug
e-deck (rear) [PWR OUT]	Oscilloscope	Standard Modular AC Line Plug
e-deck (rear) [Cond.]	Conductivity Module [Cond. Out]	12V Signal Cable (?-?)

Power Up/Down

To power up the UVOST, simply switch the power on using the power switch on the front of UVOST's e-deck. All peripheral devices are powered through the cabling – minimizing tangles and trip hazards. The laser takes several minutes of warm-up and Wait LED will then light. Once warmed the user is notified by the Ready light. Push the On button to activate lasing. Lasing LED should light. There should be a small rectangular yellow glow on the yellow glass indicator at front of launch optics assembly. The oscilloscope should display Trig'd – if laser has sufficient output (not in need of recharge).

Set laser rep rate to between 63-65 Hz. If powering up from cold conditions (overnight, etc.), make sure you have laser running at least 10-15 minutes prior to attempting your first RE calibration. We recommend running heaters overnight if in sub-freezing conditions to minimize warm-up times in the morning. Extremely high or low temperatures negatively affect laser power. If used in extreme conditions one should attempt to house/store the UVOST system in a warmer/cooler environment to assure proper operation. There are no hard/fast rules for this – since case temperatures/heaters can assist but a lot depends on winds, ventilation, direct sun, etc.

To power down the UVOST, first Stop the laser pulsing, then switch off the power button.

Boot PC and Check Software Function

Make sure all drivers are loaded and ready. Start the OST system software. Indicators in the software will assist in alerting you to problem connections and general status of the components (Hardware Tab). See software manual for specifics on OST software.

Proper System Function

Once the software is started and functional you can proceed to check the depth encoding and associated peripheral functions. Actuating the probe (or hand advancing the string pot) should show Current Depth changing on the OST software (Depth tab). The Remote Display should be functional and show status. Activate Info tab and make sure your job information is updated for storage with each LIF log.

SPOC Setup

A detailed discussion is available under SPOC Assembly heading. Carefully examine mirror and window for ANY trace grease, lint, and moisture. They must be very clean. Assure that all o-rings, seals, and adapters are in correct order – including Teflon tape, and associated hardware. With SPOC tip left off of SPOC, dry the air inside the SPOC, and quickly screw in window. You can check for moisture condensing inside window using an ice cube. If there is condensation you must dry the SPOC air better. Slightly tighten the mirror and fiber optic Swagelock seals (just snug). Adjust fiber terminator up/down to achieve proper distance from mirror to collimate the laser beam (use white paper – you may have to "up" energy for this).

Place RE in front of window and adjust laser energy (Fiber I/O block screw) to achieve approximately ¾ scale with oscilloscope's CH2 on 50 mV/div. Adjust the mirror (using window pick/hook) to image only the sapphire window – not epoxy or SPOC barrel (no clipping – full circle image on paper). This occurs approximately 1/3 of the way down from top of window.

Clean/polish window and then make sure that background does not exceed ~2.5mV peak signals. If background is high, carefully inspect for imaging of sides/epoxy or contamination (lint, cotton fibers, fuel, moisture, grease, etc.) An unacceptably high background can make interpretation extremely difficult.

Once you're certain the mirror/fiber/window system is achieving proper results you can tighten the Swagelocks securely. Use ONLY the supplied wrenches to hold the SPOC securely during tightening. This is most readily assured by laying SPOC down and only handling wrenches. Use the mirror pick/hook to hold the mirror firmly in place during tightening to prevent rotation. Make sure laser beam stays in centered in the window (side to side) and 1/3 down from the top (toward first rod).

With window/mirror/fiber terminator all secured, proceed with attaching drive tip, adapter, extension rod, and tighten extremely well with 2 pipe wrenches or pipe wrench and vice. Teflon tape helps reduce loosening from rattling/vibration.

Background

Wipe window clean and acquire a Background (blank) waveform with the Acq BckG command. A perfect system would yield no waveform at all – only white noise. But there is always trace fluorescence from mirror/window, fiber-generated Raman, and contamination. Try to achieve <2mV peak signal in any one channel. You simply want it as small as you can get it. A severely jagged/noisy background indicates possible pickup of the large laser EMF (Electric and Magnetic Fields) into the trigger and signal coax cables. Loose grounds, connections, misrouting of cables, etc. can induce this. If the first channel (350 nm) is considerably large than the other three, there is a chance that you have excessive backscatter of laser light into the system (350nm filter is near laser wavelength) or the laser rejection filter (inside I/O block) may be damaged or malfunctioning. Channels 3 and 4 being high/narrow is a classic lint signature. A background waveform that looks like your current contaminant of interest suggests leakage and contamination of the internal SPOC mirror/window OR simply a dirty window. Clean with methanol or solvent if soap/water doesn't work.

RE Calibration

Calibration should be done as immediately preceding each UVOST logging event. Don't calibrate with RE, then spend time monkeying around with push rig, etc. Wait until the direct push rig is ready to go. Pre-push with dummy tip if obstructions are likely or getting a "straight hole going" is

difficult. Place RE holder on window (making sure window is very clean). Immediately acquire RE with Acq RE command. Extended exposure to laser light can form excimers and photodegradation – causing a morph in waveform shape/intensity. If you have changed fiber optic lengths the software may correct the delay time to achieve proper position in window. Make sure the RE signal level exceeds a 10, 000 pVs minimum but does not exceed 20,000 pVs with 14,000-15,000 pVs about optimum. Try to be consistent (± 1000 pVs) – especially when on the same project/site. Make sure the RE waveform shape "looks right". Compare it to the reference waveform displayed on the scope during the RE acquisition. Extremely noisy/jagged REs, misshapen REs, and missing/low channel contributions indicate damaged or loose fiber optics/filters/detector.

Logging

Follow these steps to acquire a UVOST log:

Step 1. With proper RE and background acquired, pertinent log information recorded, and probe in position (window just below (~1 inch) ground surface), activate the Record command.

Step 2. If you failed to acquire a recent RE the OST software will alert you that it's not recent (at least one log event old). Proceed with you recent (perhaps you just aborted a "false start"/crooked log) – or cancel out and acquire the RE you forgot to acquire. You can "rescue" an RE if it's for a rational purpose (such as an accidentally aborted log and you want to continue logging and probe is under ground, under water during a barge project, etc.) DO NOT purposefully continue logging without a new RE for each and every log if you're having problems acquiring a new RE due to a problem. FIX the problem, acquire a good RE, then proceed. Failure to acquire a new RE for each log will generate inaccurate data.

Step 3. Choose a directory and name for your log. UVOST auto-suggests the name sequentially in an attempt to reduce typing. In order to absolutely avoid accidental overwrite of any OST file, the OST software creates a unique time/date name and uses that name in place of overwrites (even though you said "OK" to the overwrite. If you want to risk it, you can always delete a file from the Save File dialog after you click on it once, but before hitting OK. That prevents the Windows software from reporting an overwrite to the OST and cueing the unique filename routine. The safest method is to choose OK to overwrite – and rename files later.

Step 4. Once the name is chosen you are asked to choose whether or not to "zero" the depth. For normal logs you always choose Yes and zero out depth. If you're continuing an aborted log that you want to continue (accidental termination) – choose No. Log should continue at depth where you left off.

Step 5. As the log progresses, it is your responsibility to make sure the system is operating properly. Observe the oscilloscope or OST display to watch for unusual events such as:

A. Try to keep the probe advancing at approximately 0.75 inch/sec – your company may choose less – but we do not recommend faster

B. Strange background drifts several feet under (possible fogging), etc.

C. Broken depth cable or poor connection will result in jumps in depth or a loss of depth increase – even though the operator is advancing the probe

D. Incorrect depths would indicate a possible rod length or string pot cal factor mismatch

E. Sudden loss of waveform (flatline) indicates possible fiber optic break due to broken probe

F. depth is advancing – but no new waveform updates aren't showing up – this indicates poor triggering – is Trig'd showing up on oscilloscope every second or so? if not – hit Trigger

50% button on scope or look for other cause such as Stop button on laser being accidentally pushed.

Step 6. Once refusal is reached – or target depth is reached – activate the End command. All pertinent data is stored and the oscilloscope scale is automatically returned to the default 50mV/div scale in preparation for next RE.

Step 7. Inspect the probe, window, etc. for leaks, breaks, and loose parts in preparation for next the next logging event (push).

Printing/Exporting LIF Logs

Once the push is complete the log can be viewed (a log can be also opened from file and viewed with the OST software) it is necessary to print the log to paper or export it to an electronic image (JPG file). Prior to print/export it is most often desirable to select callout waveforms. Select single waveforms by clicking the log at any depth – which creates a stats bar. Transfer single logs by dragging/dropping the stats bar or with the < bar next to each callout box. Select the average of a region of waveforms along a log by clicking the log, holding down, then releasing at a second depth along the log. Transfer average zone waveforms by dragging/dropping the bottom stats bar or with the < bar next to each callout box. Reasons to select certain depths/regions include:

- Bracketing what appear to be continually affected zones - this helps the client/consultant "summarize" the general NAPL zones and easily jot down depths for future validation sampling, project design, discussion with site owner, etc.
- It's best to bracket large zones of homogenous NAPL - do not span different products
- Highlighting unusual signatures – perhaps to suggest sampling there or to "flag" things the client needs to investigate or discount
- Maybe a background here/there to remind viewer what "clean" looks like
- Any potential "false positives" such as mineral/plant/urban background/highly degraded NAPL – the different waveform should help client understand that "it's nothing to worry about"
- Use caution when highlighting single waveforms from the rising edge of NAPL hits – the waveforms in these area are usually saturated because the oscilloscope scaling wasn't able to fully respond – they are morphed and ugly and cause unnecessary confusion and alarm
- You do not have to start with top and work down – pick a callout "straight across" for neater appearance
- Avoid "crossing" of the depths of multiple callouts as this looks messy/confusing

It is best that the UVOST operator and the client discuss depth/RE scales, depths of interest, etc. ahead of time to hopefully avoid lots of "reprints".

It is suggested that you annotate the callouts (text box under each waveform) in order to guide the client. If it's the usual product you expect then leave it blank – but if it's unusual, significant, or out of the ordinary, guide the viewer with a brief description.

Each time you print/export the settings are saved in a lif.plt (plot) file. That way the same callouts and depths are available later. The OST software (and we) suggest that the very first print/export a log in the filed you save it as field. That way you always know what the client received originally. Subsequent print schemes are saved as well. Later, upon opening, you can choose which of the various schemes to open the file with.